SEA-DOO®

Shop Manual Supplement 2004

3D™ RFI™

This Supplement must be used in conjunction with the 2004 Sea-Doo Shop Manual (P/N 219 100 192).

219 100 199

2004
Shop Manual Supplement

3D™ RFI™

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NOTE: Refer to shop manual for sections NOT covered in this supplement.

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SAFETY NOTICE

This manual has been prepared as a guide to correctly service and repair the 2004 3D™ RFI™SEA-DOO watercraft. This Shop Manual Supplement must be used in conjunction with the 2004 Sea-doo Shop Manual (P/N 219 100 192). Refer to this manual when a particular system is not covered in this Supplement.

This edition was primarily published to be used by watercraft mechanical technicians who are already familiar with all service procedures relating to BRP made watercraft. Mechanical technicians should attend training courses given by BRP Training Dept.

Please note that the instructions will apply only if proper hand tools and special service tools are used.

This Shop Manual Supplement uses technical terms which may be slightly different from the ones used in the Parts Catalog.

It is understood that this manual may be translated into another language. In the event of any discrepancy, the English version shall prevail.

The content depicts parts and/or procedures applicable to the particular product at time of writing. Service and Warranty Bulletins may be published to update the content of this manual. Make sure to read and understand these.

In addition, the sole purpose of the illustrations throughout the manual, is to assist identification of the general configuration of the parts. They are not to be interpreted as technical drawings or exact replicas of the parts.

The use of BRP parts is most strongly recommended when considering replacement of any component. Dealer and/or distributor assistance should be sought in case of doubt.

The engines and the corresponding components identified in this document should not be utilized on product(s) other than those mentioned in this document.

⚠ WARNING

Torque wrench tightening specifications must be strictly adhered to. Locking devices (ex.: locking tab, self-locking fasteners, etc.) must be installed or replaced with new ones. If the efficiency of a locking device is impaired, it must be renewed.

⚠ WARNING

Unless otherwise specified, engine should be turned OFF and cold for all maintenance and repair procedures.

This manual emphasizes particular information denoted by the wording and symbols:

⚠ WARNING

Identifies an instruction which, if not followed, could cause serious personal injury including possibility of death.

CAUTION: Denotes an instruction which, if not followed, could severely damage vehicle components.

NOTE: Indicates supplementary information needed to fully complete an instruction.

Although the mere reading of such information does not eliminate the hazard, your understanding of the information will promote its correct use. Always use common shop safety practice.

SAFETY NOTICE

BRP disclaims liability for all damages and/or injuries resulting from the improper use of the contents. We strongly recommend that any services be carried out and/or verified by a highly skilled professional mechanic. It is understood that certain modifications may render use of the vehicle illegal under existing federal, provincial and state regulations.

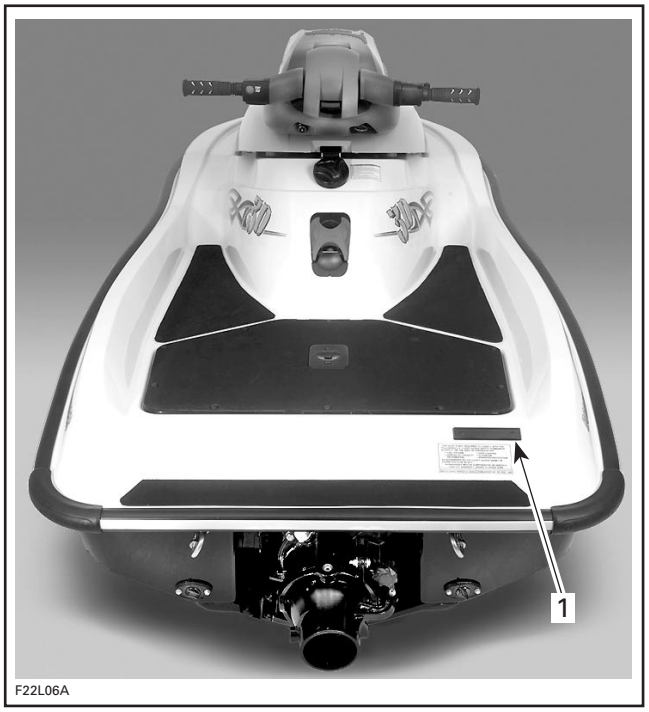
INTRODUCTION

This Shop Manual Supplement covers the following BRP made SEA-DOO® 2004 3D™ RFI™ watercraft models.

MODEL	ENGINE TYPE	MODEL NUMBER
3D RFI	787 RFI	6157
3D RFI International	787 RFI	6158

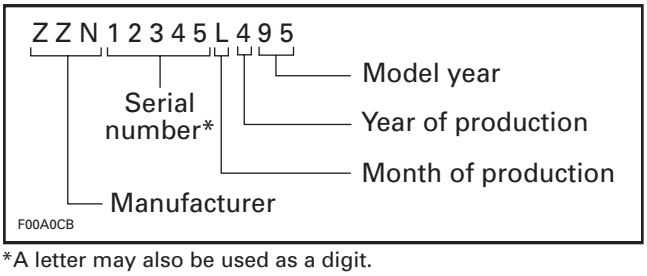
HULL IDENTIFICATION NUMBER (H.I.N.)

It is located on platform at the rear of watercraft.



1. Hull Identification Number (H.I.N.)

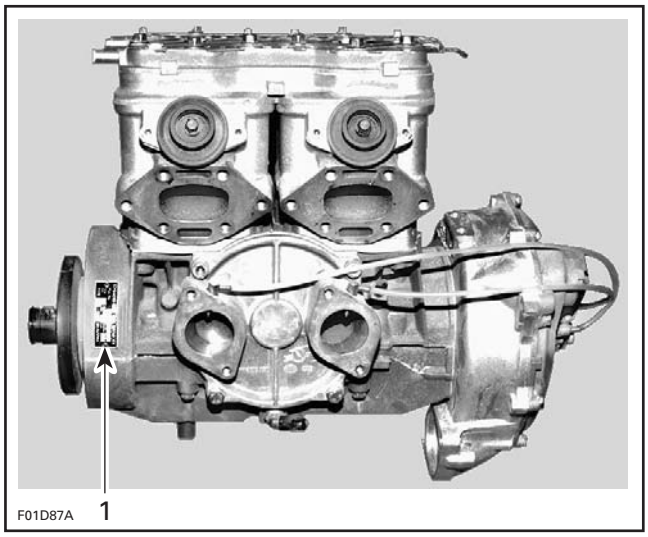
The Hull Identification Number is composed of 12 digits:



*A letter may also be used as a digit.

ENGINE IDENTIFICATION NUMBER (E.I.N.)

The Engine Identification Number is located on the upper crankcase on PTO side.



1. Engine Identification Number (E.I.N.)

PERIODIC INSPECTION CHART

The schedule should be adjusted according to operating conditions and use.

NOTE: The chart gives an equivalence between number of hours and months/year. Perform the maintenance operation to whatever time comes first.

IMPORTANT: Schedule for watercraft rental operations or higher number of hour use, will require greater frequency of inspection and maintenance.

DESCRIPTION I: Inspect, verify, clean, adjust, lubricate. Replace if necessary C: Clean L: Lubricate R: Replace	**INTERVAL**			
	FIRST 10 HOURS	EVERY 25 HOURS OR 3 MONTHS	EVERY 50 HOURS OR 6 MONTHS	EVERY 100 HOURS OR 1 YEAR
GENERAL				
Lubrication/corrosion protection	(1)		L	
ENGINE				
Support and rubber mount	I		I	
Seals and fasteners	I		I	
Exhaust system fasteners (5)	I		I	
Expansion pipe				I
RAVE valve (5)			C	C
Counterbalance shaft oil level			I	I
Spark plug (5)	I (4)		R	
Ignition timing (5)				I
COOLING SYSTEM				
Flushing		C (3)		
Hose and fasteners	I		I	
Engine drain tubes		I (1)		
FUEL SYSTEM				
Throttle cable	(1)	I		
Fuel injection system sensors (except throttle body) (5)	I			I
Throttle body and TPS (5)	I		I	
Fuel lines, fuel rail, fittings, check-valve, relief valve and fuel system pressurization (5)	I	I		
Air intake silencer fit/tightness	I			I
Fuel tank straps	I			I

DESCRIPTION I: Inspect, verify, clean, adjust, lubricate. Replace if necessary C: Clean L: Lubricate R: Replace	INTERVAL			
	FIRST 10 HOURS	EVERY 25 HOURS OR 3 MONTHS	EVERY 50 HOURS OR 6 MONTHS	EVERY 100 HOURS OR 1 YEAR
LUBRICATION SYSTEM				
Oil injection pump (5)	I			I
Oil lines	I	I		
Oil filter	I	I		R
Oil reservoir straps	I			
ELECTRICAL SYSTEM				
Electrical connections and fastening (ignition system, starting system, fuel injectors, etc.) (5)	I			I
MPEM and ECU mounting support/fasteners			I	
Digitally Encoded Security System and safety lanyard/post	I			I
Monitoring beeper	I		I	
Battery support/fasteners	I		I	
STEERING SYSTEM				
Steering cable	I		I	
Steering pole	I		I	
Handlebar and adjuster operation	I		I	
“Moto” seat	I		I	
O.T.A.S.tm SYSTEM				
O.T.A.S. system operation	I			I
PROPULSION SYSTEM				
Drive shaft protection hose			I (2)	
Seal carrier	L	L		
Driveshaft/impeller splines			L	
VTS (Variable Trim System)	I		I	
Jet pump reservoir oil	R	I	R	
Jet pump cover pusher			I	
Impeller shaft seal				R (4)
Impeller and impeller/wear ring clearance			I (2)	
Water intake grate			I (2)	

DESCRIPTION I: Inspect, verify, clean, adjust, lubricate. Replace if necessary C: Clean L: Lubricate R: Replace	**INTERVAL**			
	FIRST 10 HOURS	EVERY 25 HOURS OR 3 MONTHS	EVERY 50 HOURS OR 6 MONTHS	EVERY 100 HOURS OR 1 YEAR
HULL/BODY				
Bailer pick-ups, check for obstructions	I			I
Kart seat (if so equipped)	I		I	
Hull	I			I

(1) Every 10 hours in salt water use.

(2) These items have to be initially checked after 25 hours. Thereafter, servicing to be made as specified in this chart.

(3) Daily flushing in salt water or foul water use.

(4) Replace at 150 hours or after 2 years, whichever comes first.

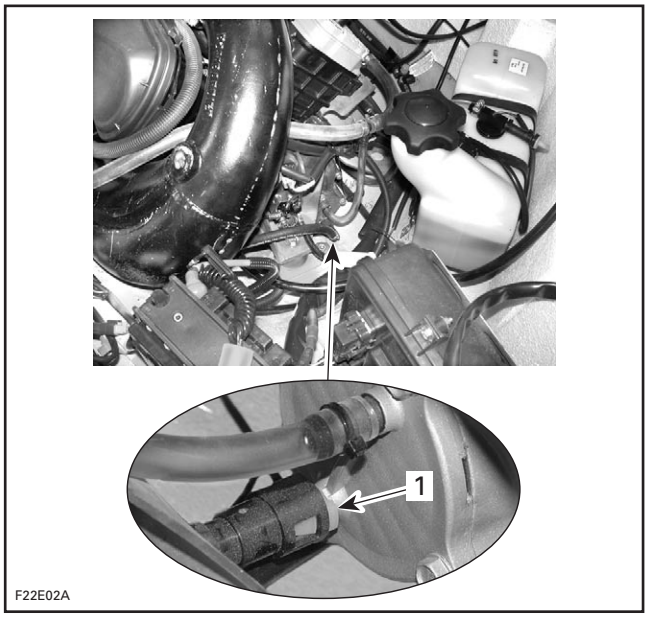
(5) Emission-related component.

STORAGE

ENGINE DRAINING

Disconnect the water supply hose used to cool the magneto. It features a quick connect fitting. Press both tabs and pull fitting in order to disconnect hose.

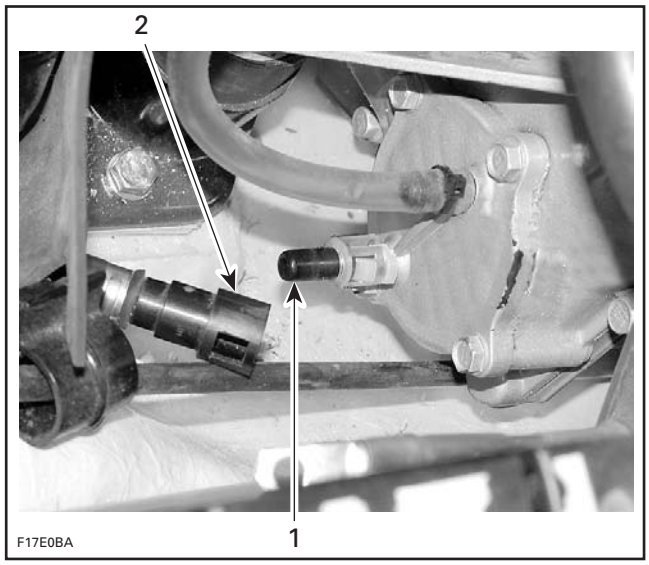
This hose is located at the bottom of the magneto cover beside the engine support.



1. Press tabs here and disconnect hose

Water should flow out of the fitting (magneto cooling circuit) and hose (crankcase heat exchanger). Push and hold hose against bilge so that draining can take place.

NOTE: It may be necessary to position the end of the hose in a lower area of the bilge to allow proper drainage.



1. Fitting
2. Hose

CAUTION: Water in heat exchanger system must be free to flow out. Should water freeze in engine, severe damage will occur.

Reconnect hose when done.

PROPULSION SYSTEM

Jet Pump

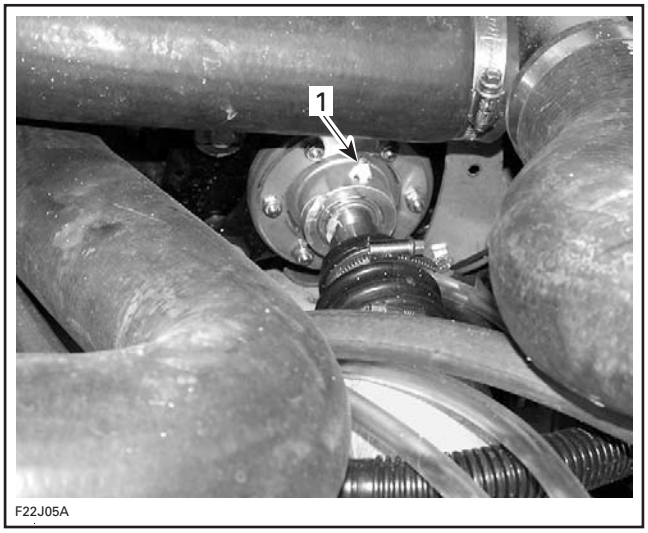
Lubricant in impeller shaft reservoir should be drained. Reservoir should be cleaned and refilled with SEA-DOO synthetic 75W90 GL5 polyester oil. Refer to JET PUMP in the Shop Manual for proper procedure.

CAUTION: Use only SEA-DOO jet pump oil or equivalent synthetic gear oil, otherwise component service life could be reduced. Do not mix oil brands or types.

Seal Carrier

Remove rear access cover.

Lubricate seal carrier of drive shaft support with synthetic grease. Stop lubricating when grease is just coming out of seal.



1. Grease seal carrier

FUEL SYSTEM

Inspect fuel hoses. Replace damaged hoses or clamps if necessary.

Sea-Doo Fuel Stabilizer (P/N 413 408 600) or equivalent should be added in fuel tank to prevent fuel deterioration. Follow manufacturer's instructions for proper use.

CAUTION: Fuel stabilizer should be added prior to engine lubrication to ensure fuel system components protection against varnish deposits.

Fill up fuel tank completely. Ensure there is no water inside fuel tank.

CAUTION: Should any water be trapped inside fuel tank, severe internal damage will occur to the fuel injection system.

⚠ WARNING

Fuel is inflammable and explosive under certain conditions. Always work in a well ventilated area. Do not smoke or allow open flames or sparks in the vicinity. Fuel tank may be pressurized, slowly turn cap when opening. When fueling, keep watercraft level. Do not overfill or top off the fuel tank and leave watercraft in the sun. As temperature increases, fuel expands and might overflow. Always wipe off any fuel spillage from the watercraft. Periodically inspect fuel system.

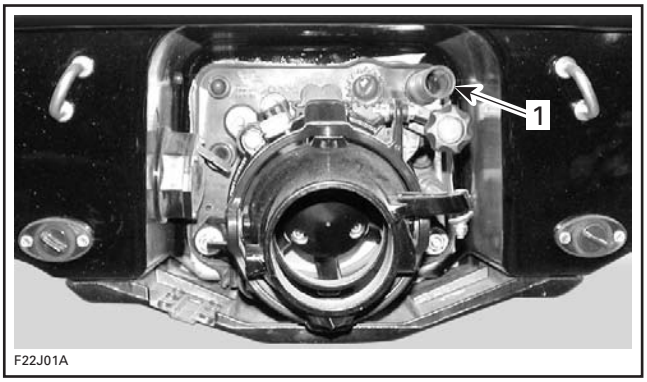
COOLING SYSTEM FLUSHING AND ENGINE INTERNAL LUBRICATION

Cooling system has to be flushed with fresh water to prevent salt, sand or dirt accumulation which will clog water passages.

Engine must be lubricated to prevent corrosion on internal parts.

For proper procedure, refer to FLUSHING AND LUBRICATION in the Shop Manual. Follow instructions for RFI models.

NOTE: On the 3D RFI, the hose adapter is located on the right hand side on the jet pump support.



1. Hose adapter

BATTERY

Disconnect battery cables.

⚠ WARNING

Battery BLACK negative cable must be disconnected FIRST.

Disconnect vent tube from battery.

Unfasten battery support.

Using battery strap, remove battery.

For battery cleaning and storage, refer to CHARGING SYSTEM in the Shop Manual.

WATERCRAFT CLEANING

Refer to STORAGE in the Shop Manual.

ANTIFREEZING PROTECTION

In cool regions (where freezing point may be encountered), cooling system should be filled with pure antifreeze.

CAUTION: Antifreeze must be fed in cooling system. Otherwise remaining water will freeze. If antifreezing is not performed adequately engine/exhaust system may freeze and cause severe damage. Always use ethylene glycol antifreeze containing corrosion inhibitors specifically recommended for aluminum engines.

CAUTION: Use only undiluted antifreeze (100% concentration). The pre-mixed antifreeze available from Bombardier Recreational Products Inc. is not suitable for this particular application. Its concentration will be reduced when mixed with remaining water trapped in water jackets. Always use ethylene glycol antifreeze containing corrosion inhibitors specifically recommended for aluminum engines. Never use antifreeze for RV (recreational vehicles).

NOTE: When available, it is recommended to use biodegradable antifreeze compatible with internal combustion aluminum engines. This will contribute to protect the environment.

NOTE: The engine will not have to run during this operation but should have been ran before, to exhaust as much water as possible, from cooling system components.

NOTE: This procedure requires approximately 2.5 L (2.6 U.S. qt) of antifreeze.

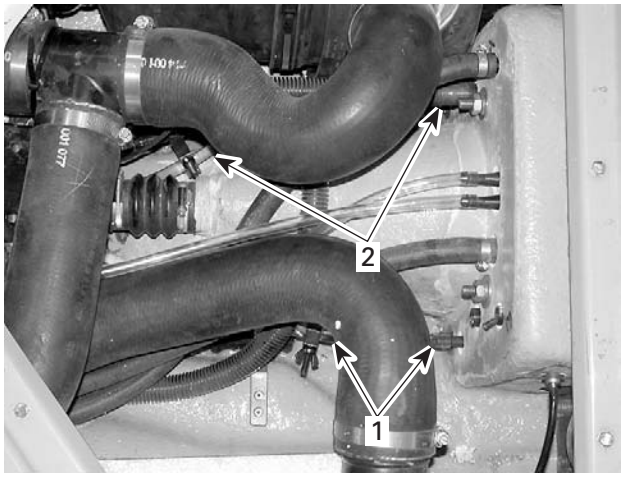
Engine and Tuned Pipe

Remove rear access panel and engine cover. Lock steering pole in upright position with the holder.

⚠ WARNING

Always install steering pole holder while working in the engine compartment.

Install hose pinchers and disconnect hoses at the following locations.



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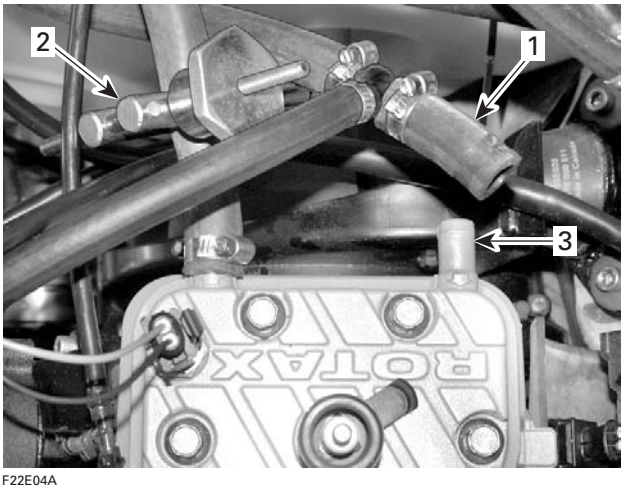
1. *Pinch Engine cylinder drain hose*
2. *Pinch Engine heat exchanger drain hose*



F22E04A

1. *Disconnect water supply hose*
2. *Pinch water outlet hose*
3. *Install a temporary hose to engine fitting*

Insert a funnel into the temporary hose and pour antifreeze in engine until the colored solution appears at the cooling system bleed outlet. Use a container to recover the water/antifreeze.

F07E0LA

TYPICAL

F22L0HA

COOLING SYSTEM BLEED OUTLET
1. Recover water/antifreeze from this outlet

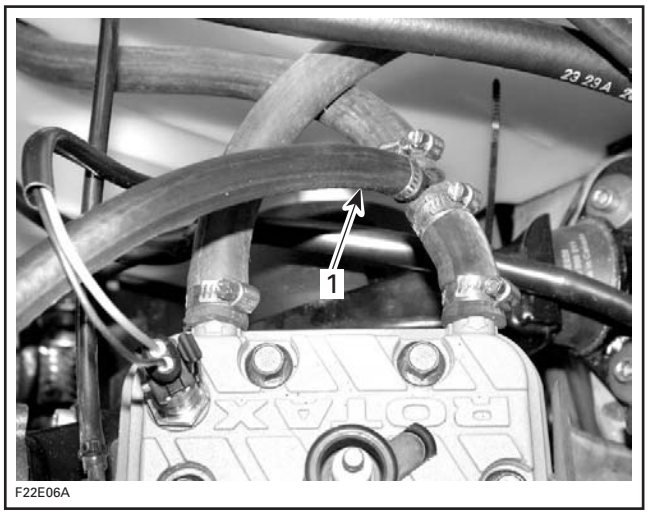
Place a container at rear of watercraft to recover the water/antifreeze from the vehicle hose adapter.

Remove the 2 hose pinchers from the engine drain hoses.

Most of the antifreeze will drain out when removing the hose pinchers. Use a container to recover it. DISPOSE ANTIFREEZE AS PER YOUR LOCAL LAWS AND REGULATIONS.

Expansion Pipe and Muffler

Disconnect the tuned pipe water supply hose at T-fitting.



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1. Disconnect hose from T-fitting

Insert a funnel into the hose.

Raise the hose as high as possible and pour 1.2 L (1.3 U.S. qt) of antifreeze.

CAUTION: It is important to keep the hose as high as possible so the antifreeze can reach the end of the expansion pipe.

Reconnect hose to the T-fitting.

Complete Cooling System

NOTE: For the above engine and exhaust system procedures, although most of the antifreeze drained out, it has mixed with any water in the water jackets.

At preseason preparation, flush out the remaining antifreeze from cooling system prior to using the watercraft.

ANTICORROSION TREATMENT

Refer to STORAGE in the Shop Manual.

TROUBLESHOOTING CHART

The following is provided to help in diagnosing the probable source of troubles. It is a guideline and should not be assumed to show all causes for all problems. Only the systems not covered in the Shop Manual are outlined. Refer to the Shop Manual for the other systems.

ENGINE WILL NOT START

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Engine does not turn over/no beep/indicator light cluster not working	Discharged battery or bad connections	Check battery state of charge and battery posts
	Defective DESS post	Check DESS post. Refer to INSTRUMENTS AND ACCESSORIES
	Burnt 20 A fuse	Check fuse
	No power at VCM	Check for battery voltage on VCM wire connector pin 6-G
	Bad ground	Check for continuity with ground on VCM wire connector pin 6-D
	Defective VCM	Replace
Engine does not turn over/no beep/indicator light cluster working	No power at MPEM	Check voltage on MPEM wire connector pin 3-26

O.T.A.S.™ SYSTEM NOT FUNCTIONAL

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Warning light flashes	Defective O.T.A.S. solenoid circuit	Check PU/WH, BK wires and connections.
	Defective O.T.A.S. solenoid	Check. Refer to INSTRUMENTS AND ACCESSORIES
	Defective VCM	Replace

BILGE PUMP DOES NOT WORK

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Warning light flashes	Defective bilge pump circuit	Check BW and BK wires. Check connections
	Defective bilge pump	Check/replace
	Defective VCM	Replace

WARNING LIGHT IS ON/ENGINE NOT RUNNING

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Beeper signal (4 short beeps every 3 seconds)	Safety lanyard on DESS post	Remove safety lanyard from DESS post

STEERING POLE IS HEAVIER THAN USUAL

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Steering pole return spring adjustment	Adjust
	Broken steering pole return spring)	Replace

STEERING POLE IS STIFFER THAN USUAL

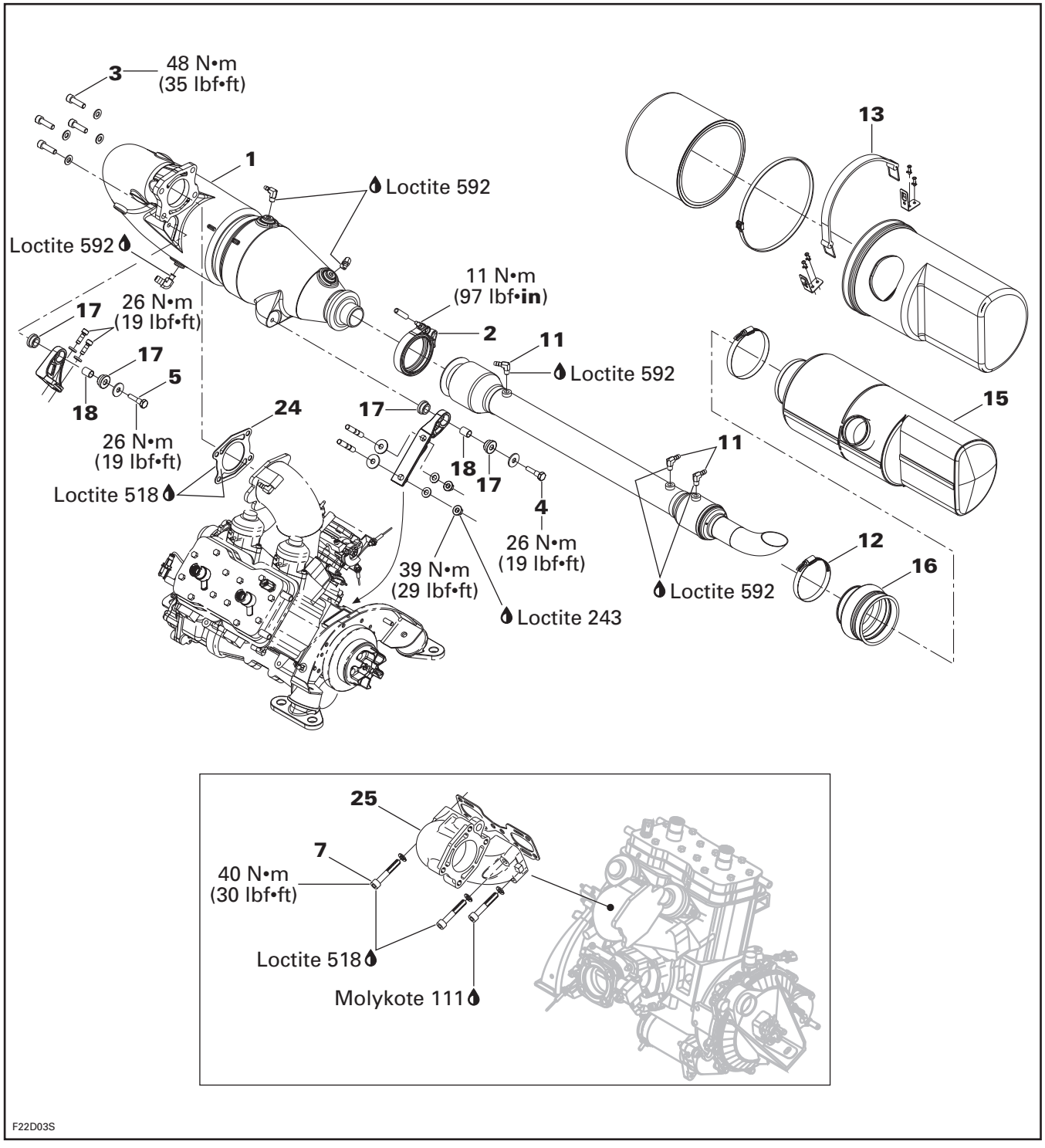
OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
	Dirty/damage parts	Inspect/clean/replace mounting bridge, clamps, tube and spring guide

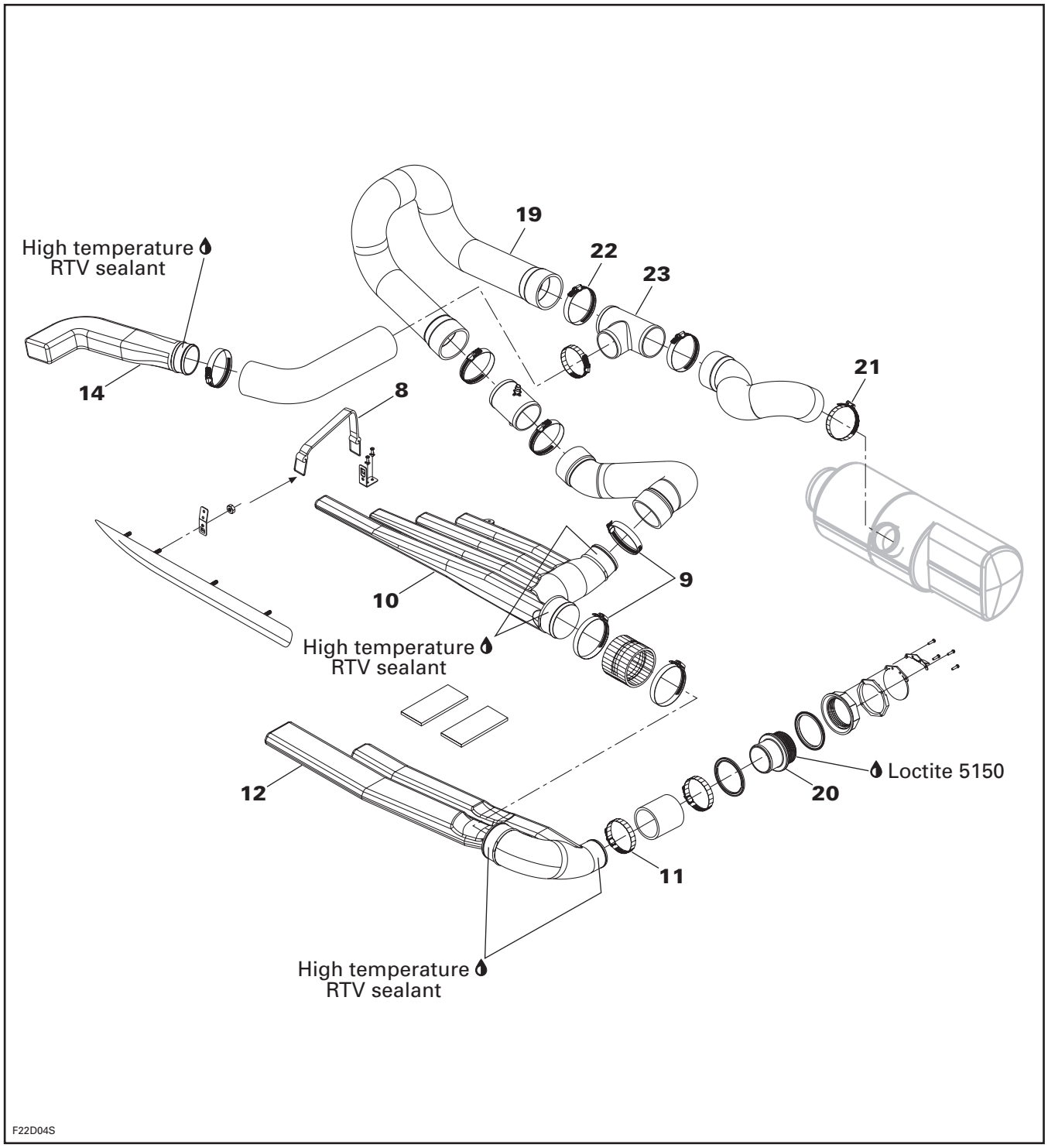
ENGINE CANNOT REACH MAXIMUM RPM (LACK OF PERFORMANCE)

OTHER OBSERVATION	POSSIBLE CAUSE	REMEDY
Increased exhaust noise/smoke in bilge	Broken expansion pipe	Inspect/replace. Refer to EXHAUST SYSTEM
Water inside expansion pipe	Broken expansion pipe (water jacket)	Inspect/replace. Refer to EXHAUST SYSTEM
Melted exhaust hose/fitting	Exhaust restriction or external water leak from exhaust cooling system	Inspect/repair

EXHAUST SYSTEM

3D RFI




High temperature RTV sealant
19
22
23
21
14
8
9
10
High temperature RTV sealant
12
Loctite 5150
20
11
High temperature RTV sealant
F22D04S

REMOVAL

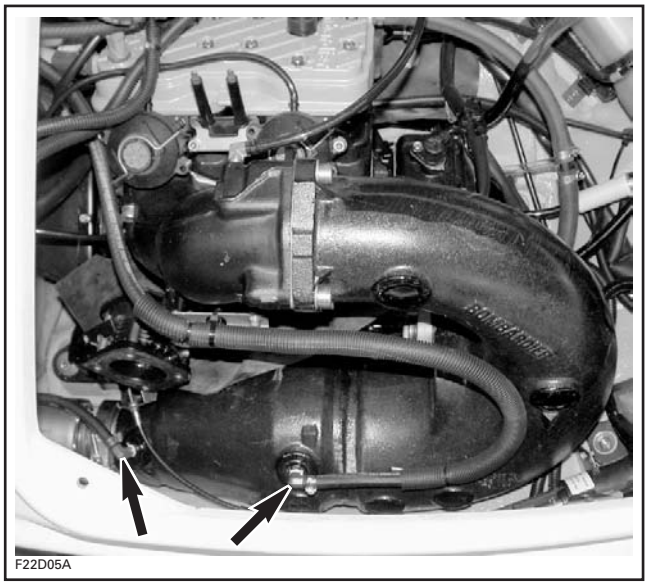
Tuned Pipe

Remove engine cover then lift and lock steering pole.

Remove air intake silencer.

NOTE: In some of the following illustrations, flame arrester and throttle body were removed for clarity only.

Disconnect hoses from tuned pipe no. 1.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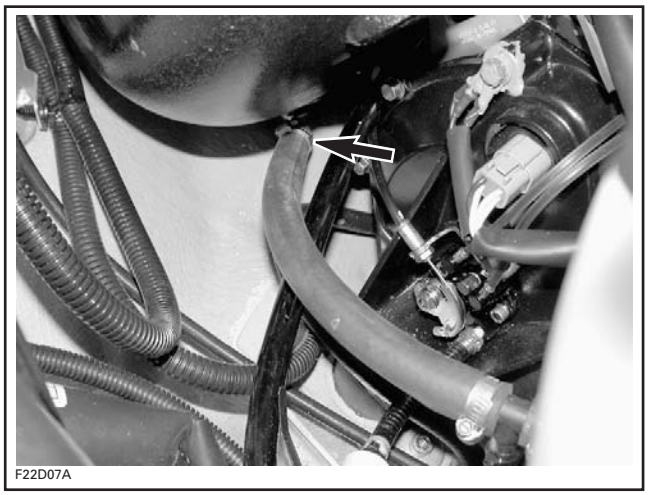
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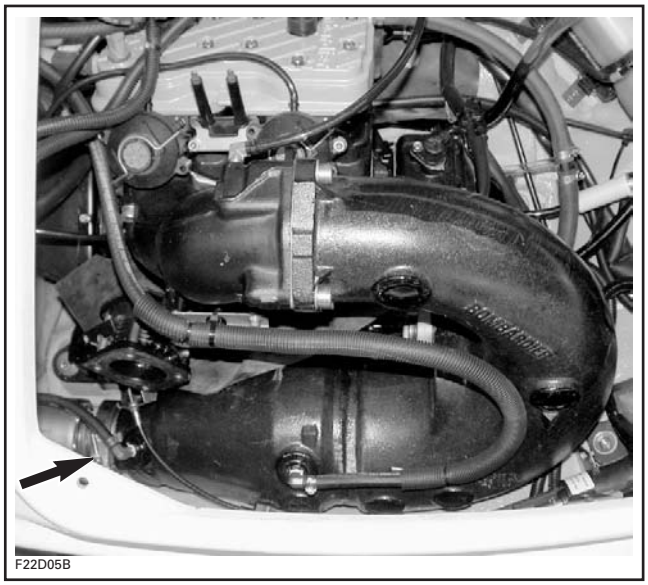
Loosen clamp no. 2 then slide rearward to release the joint.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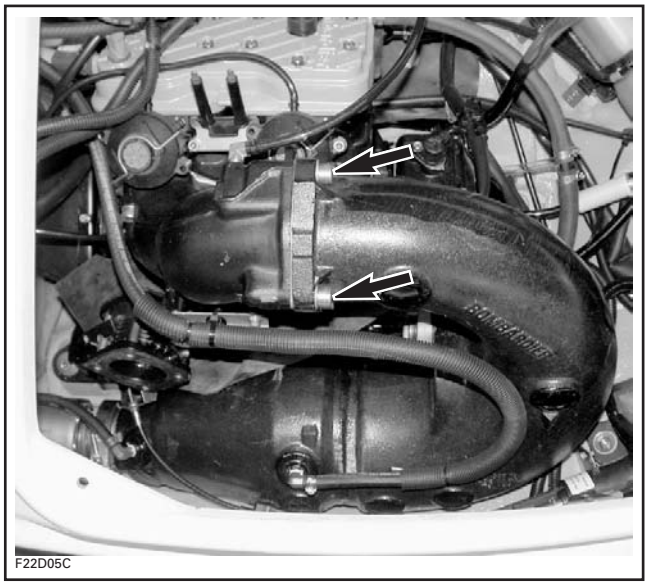
Remove:

– screws no. 3.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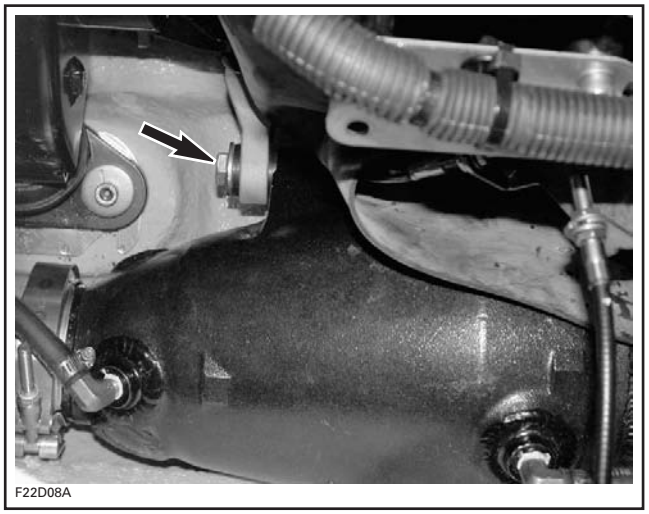
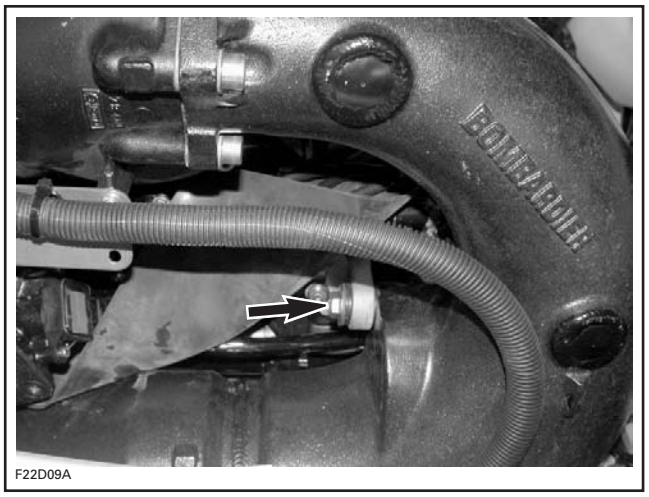
– screw no. 4 and 5.


F22D08A

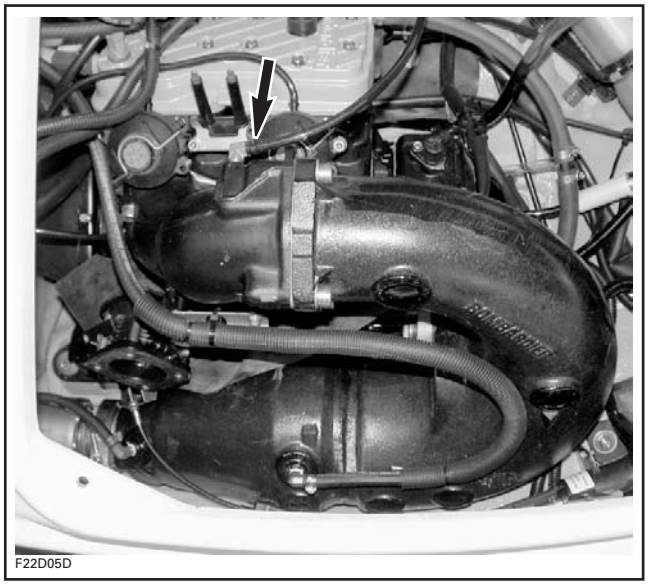


F22D09A

– tuned pipe.

Exhaust Manifold

Disconnect hose from exhaust manifold no. 25.


F22D05D

Remove screws no. 7 then withdraw exhaust manifold.

Expansion Pipe

Inspection

Do the test with the watercraft tied on a trailer in water.

NOTE: Performing the test with a garden hose connected on the flushing fitting of jet pump support would not supply enough pressure in the exhaust system to properly detect faulty joints in some cases.

Remove rear access panel.

Start engine and bring engine speed to 5000 RPM.

Check for leaks in joint area of expansion pipe. If there is exhaust gas or water leak, replace pipe.

Removal

NOTE: It is not necessary to remove tuned pipe to pull expansion pipe out.

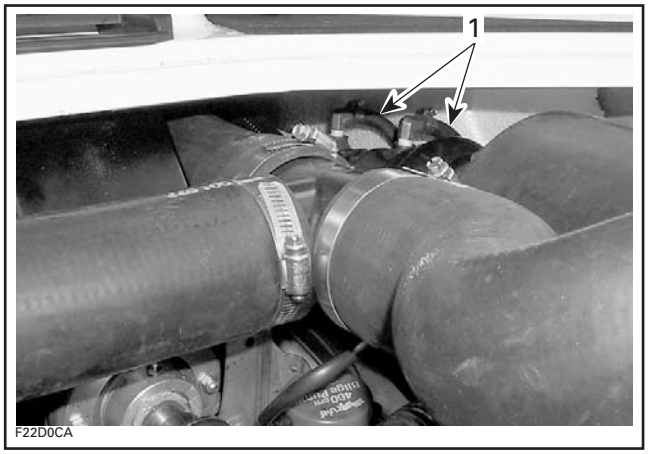
Remove/disconnect:

– flame arrester
– throttle body. Disconnect ATS and APS sensors.

⚠ WARNING

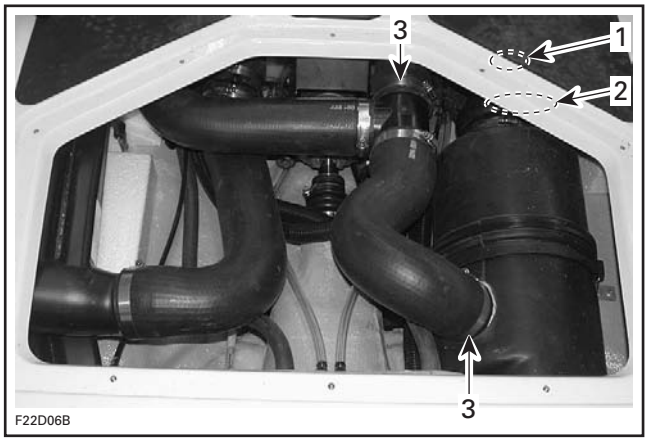
Pay attention not to bend injection oil cable or throttle cable.

– hoses from rear fittings **no. 11**



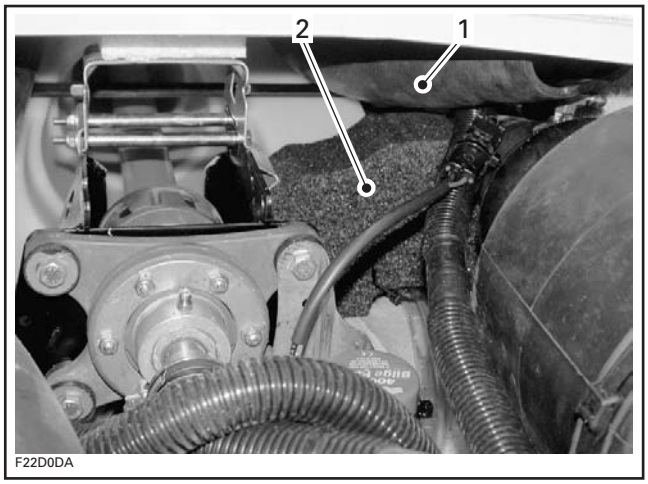
1. Disconnect hoses from fittings here

– small clamp **no. 12** from muffler **no. 15**
– strap **no. 13** from muffler
– clamps **no. 21** and **no. 22** from exhaust hoses
– T-fitting **no. 23** with hoses and resonator **no. 14** then move remaining hose away to get access to foam support

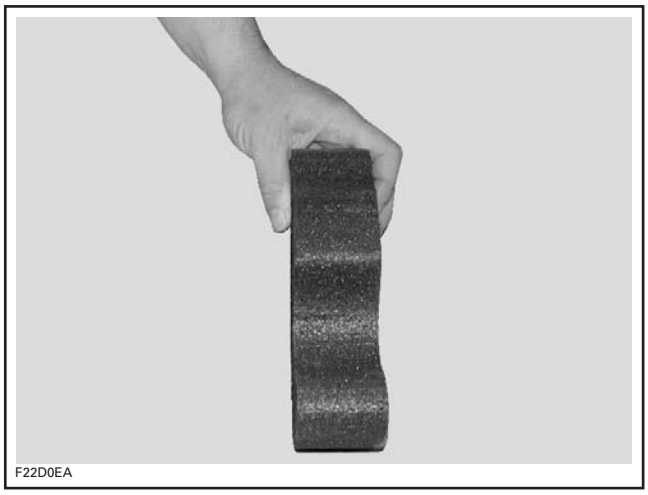


1. Disconnect small clamp here
2. Large clamp (ref)
3. Disconnect those clamps

– foam support under expansion pipe.



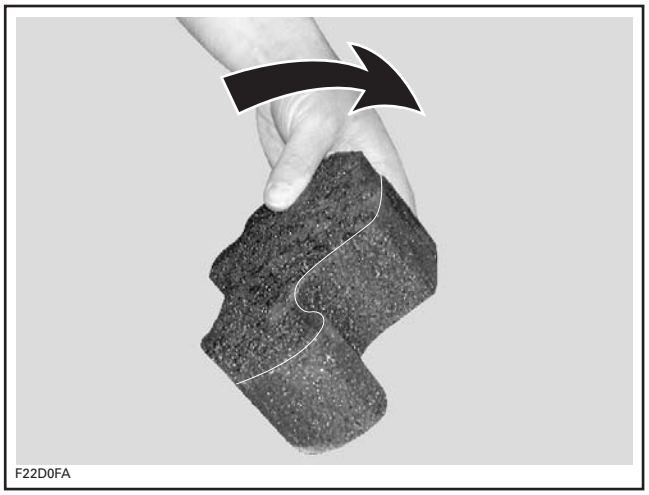
1. Hose moved away
2. Foam support



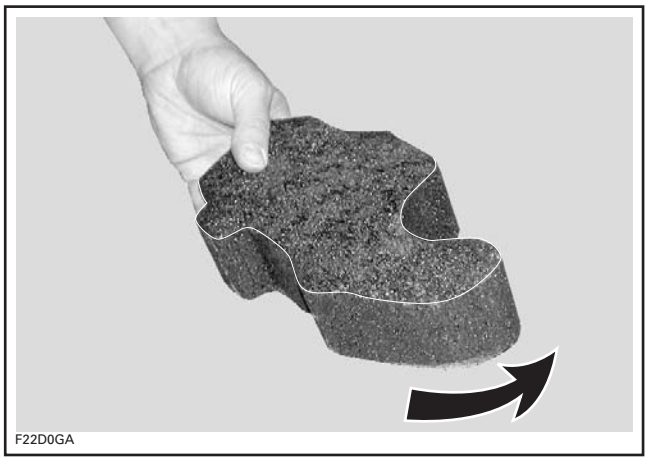
INITIAL POSITION OF FOAM

Proceed as follows:

– Tip top of foam forward as shown


F22D0FA

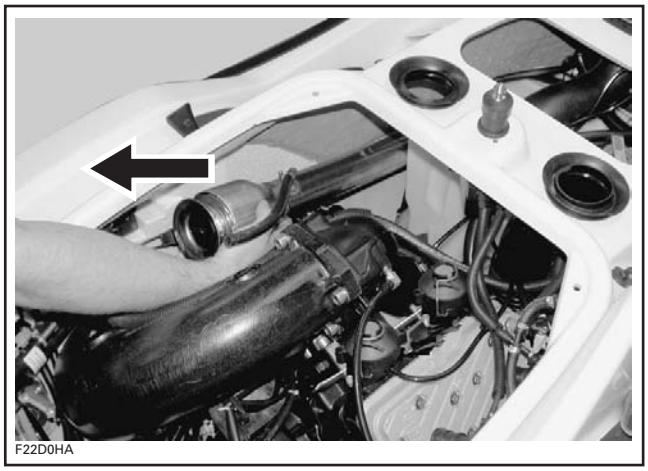
– rotate left/right as shown


F22D0GA

– pull foam out

NOTE: If tuned pipe is still in place, firmly push muffler rearward to disengage expansion pipe from tuned pipe.

– pull out expansion pipe forward. Wiggle it to disengage from muffler


F22D0HA

Muffler

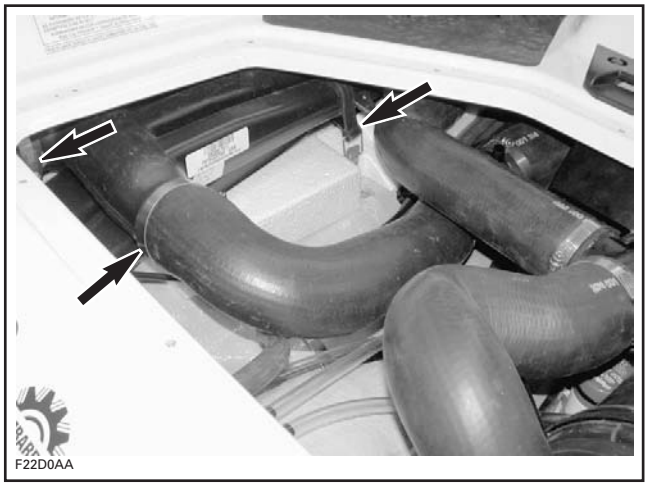
Pull muffler out.

Inspect muffler, shell and boot condition.

Resonators

Upper Resonator

Remove strap **no. 8**, loosen clamps **no. 9** then pull out resonator **no. 10**.


F22D0AA

Lower Resonator

Loosen clamp **no. 11** then pull out resonator **no. 12**.

F22D0BA

INSTALLATION

Installation is essentially the reverse of removal procedures. However, pay particular attention to the following.

Tuned Pipe

CAUTION: Torque wrench tightening specifications must be strictly adhered to. Locking devices (ex.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

NOTE: Loosen all pipe supports from engine before installing tuned pipe.

Ensure rubber bushings no. 17 and sleeve no. 18 are not damaged and are properly installed into tuned pipe supports.

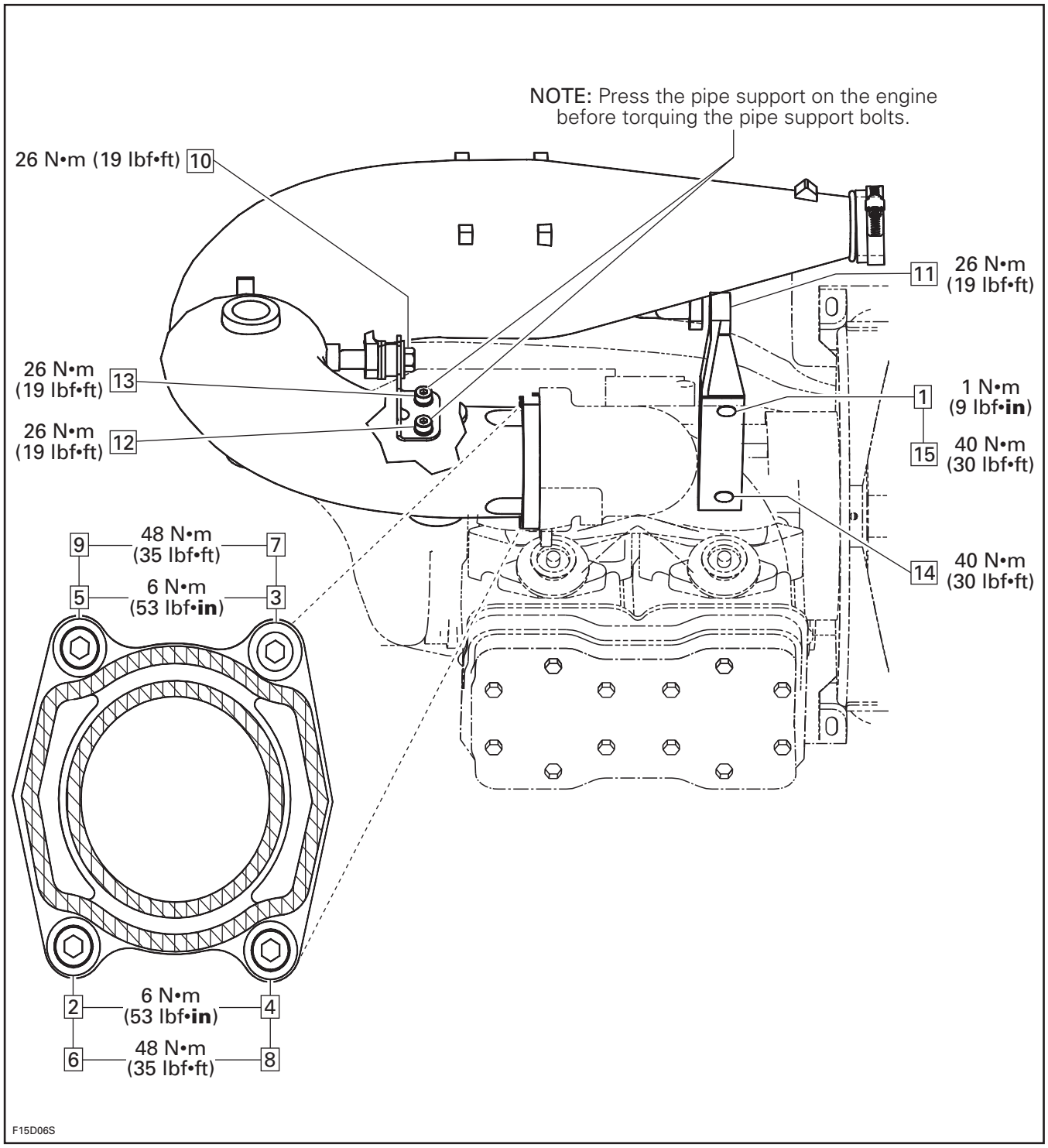
CAUTION: Damage to bushings and/or sleeve will eventually cause stress to tuned pipe and may cause cracking.

Apply Loctite 518 on both sides of gasket no. 24.

Make sure that gasket no. 24 is properly located on exhaust manifold prior to finalizing pipe installation.

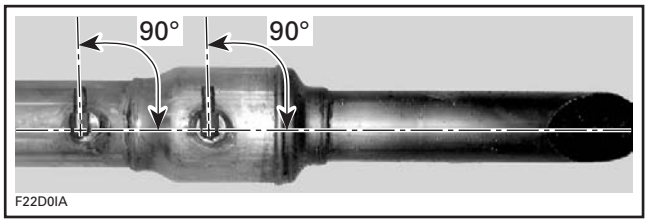
Torquing Sequence

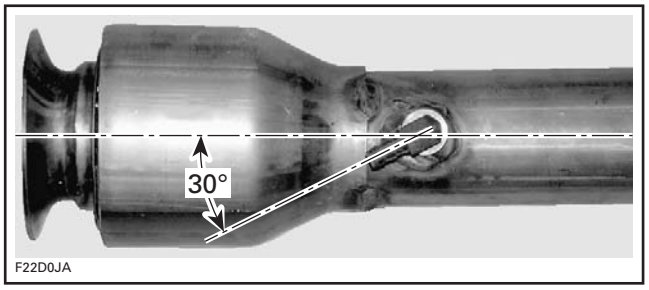
CAUTION: Torque the tuned pipe in accordance with the following sequence, otherwise serious engine damage may occur.


NOTE: Press the pipe support on the engine before torquing the pipe support bolts.
26 N•m (19 lbf•ft) 10
11 26 N•m (19 lbf•ft)
26 N•m (19 lbf•ft) 13
1 1 N•m (9 lbf•in)
26 N•m (19 lbf•ft) 12
15 40 N•m (30 lbf•ft)
14 40 N•m (30 lbf•ft)
9 48 N•m (35 lbf•ft) 7
5 6 N•m (53 lbf•in) 3
2 6 N•m (53 lbf•in) 4
6 48 N•m (35 lbf•ft) 8
F15D06S

Expansion Pipe and Muffler

Apply Loctite 592 on threads of fittings **no. 11**. Tighten fittings to 5 N•m (44 lbf•**in**) then position as per following illustration. Do not screw more than 1 turn while positioning. Do not unscrew to reposition.





Pressurize the wall jacket to 103 kPa (15 PSI) through the fittings. No leak should occur.

Position muffler **no. 15** in its location. Do not install the strap and the small clamp yet.

Insert expansion pipe in its position.

⚠ WARNING

Pay attention not to bend injection oil cable or throttle cable.

Loosely install a NEW clamp **no. 2**.

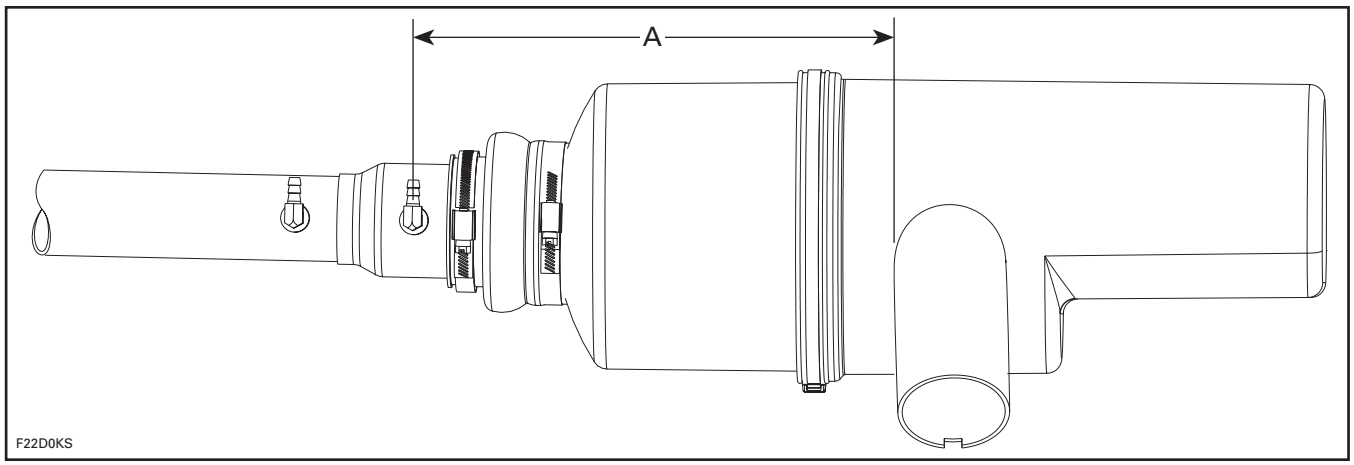
CAUTION: Those clamp type are not designed to be removed and reinstalled many times. Reinstalling a used clamp is likely to fail.

Reinstall hoses to T-fittings **no. 11**. Rear hoses can be connected on any fitting. Ensure to keep the same hose routing (inverted U shape).

CAUTION: If hoses length or routing were changed, water ingestion might occur when watercraft tips over.

Strongly push expansion pipe toward muffler to insert it into bellow **no. 16**.

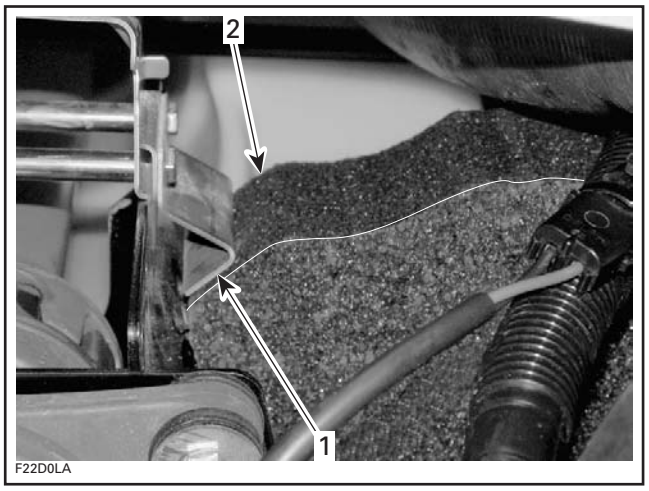
To ensure pipe end is well inserted in muffler, measure the distance as shown in the following illustration.



A. 322 mm (12.68 in)

Insert foam under expansion pipe. Ensure foam is not against muffler bellow.

Position foam under bracket edge so that it is properly retained.



1. Bracket edge
2. Foam

Rotate expansion pipe to position its T-fittings vertically.

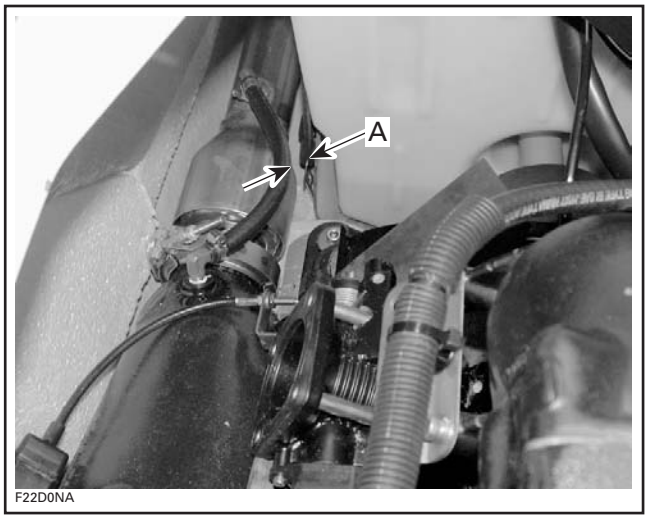
CAUTION: If T-fittings were not installed vertically, water ingestion might occur when watercraft tips over.

Tighten front clamp **no. 2** as follows.

– Ensure to align expansion pipe with tuned pipe so that their ends are in contact all around.
– Tighten clamp while maintaining expansion pipe and tuned pipe together.
– Torque clamp to 11 N•m (97 lbf•**in**).
– Ensure there is a gap between clamp ends. Otherwise, try another clamp.

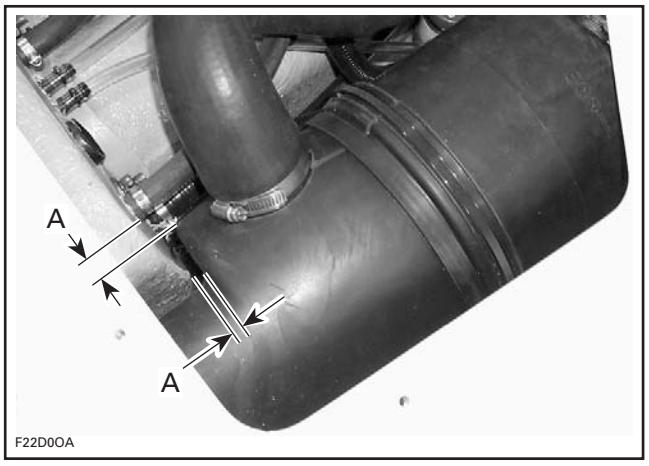
A. Clamp ends must have a gap here

Ensure there is a gap between hose at front T-fitting and fuel tank.



A. Gap between hose and fuel tank

Ensure there is a gap between muffler and bilge/cooling hose.



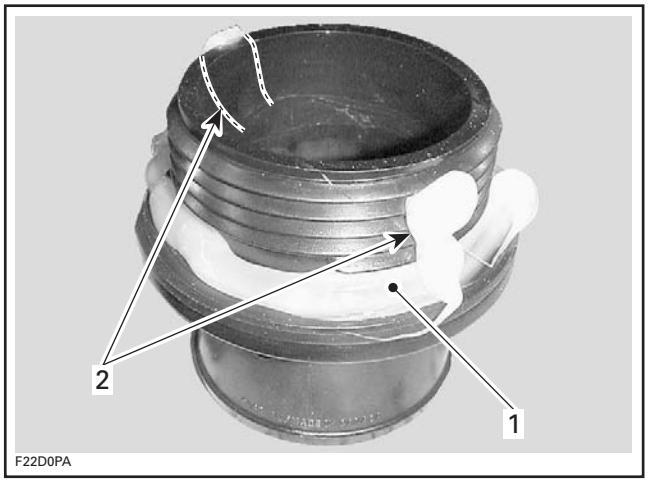
A. Gap between muffler and bilge/cooling hose

Tighten small bellow clamp **no. 12**. Ensure bellow is not trapped between foam and expansion pipe.

Ensure exhaust hose **no. 67** rests against fuel tank.

Exhaust Outlet

Prior to installing exhaust outlet **no. 20**, apply Loctite 5150 as shown.



1. All around
2. Opposite vertical lines

Finalizing Assembly

⚠ WARNING

Ensure that tubes and hoses are properly routed away from any rotating, moving, heating or vibrating parts. Also ensure that hot parts are properly positioned away from any part that can be damaged by the heat.

Reinstall remaining parts.

Depress and release the throttle lever. It should operate smoothly and return to its initial position without any hesitation.

Reset the Closed TPS. Refer to ENGINE MANAGEMENT.

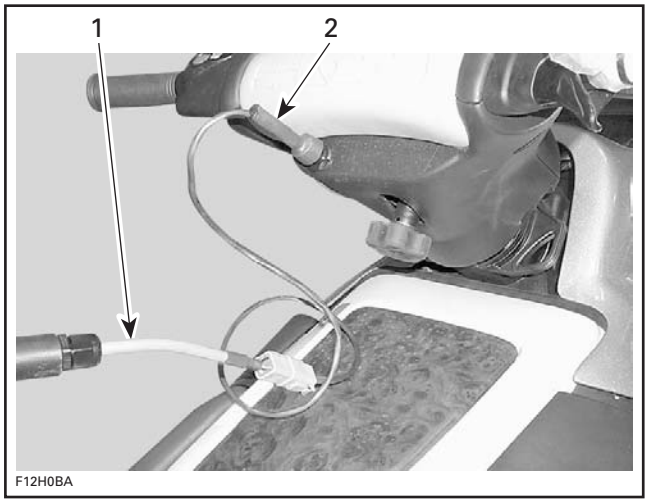
DIAGNOSTIC PROCEDURES

ADVANCED DIAGNOSTIC

VCK (Vehicle Communication Kit)

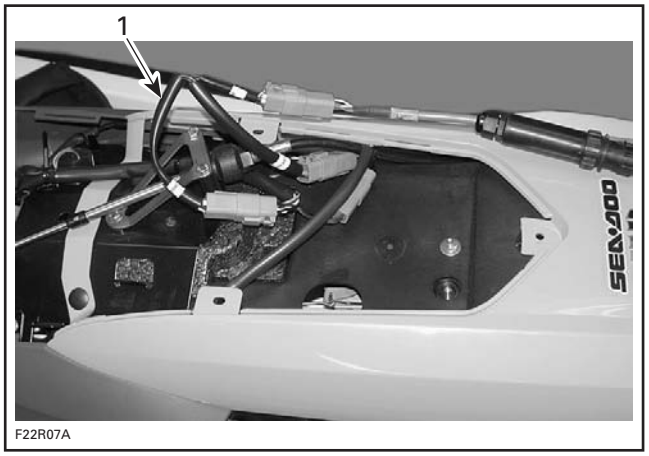
Electrical Connections

Connect VCK components and open the software B.U.D.S.



TYPICAL
1. 6-pin adapter (P/N 529 035 679)
2. DESS adapter (P/N 529 035 684)

NOTE: It is also possible to disconnect the connector located under the top cover of steering pole and install the RFI DESS adapter (P/N 278 001 978).



1. RFI DESS adapter

After all connections are done, connect the safety lanyard to the DESS post to activate the communication.

IMPORTANT: When using the software B.U.D.S., ensure that the protocol matching the connection used is properly selected in "**MPI**" under "**Choose protocol**" as per the following chart.

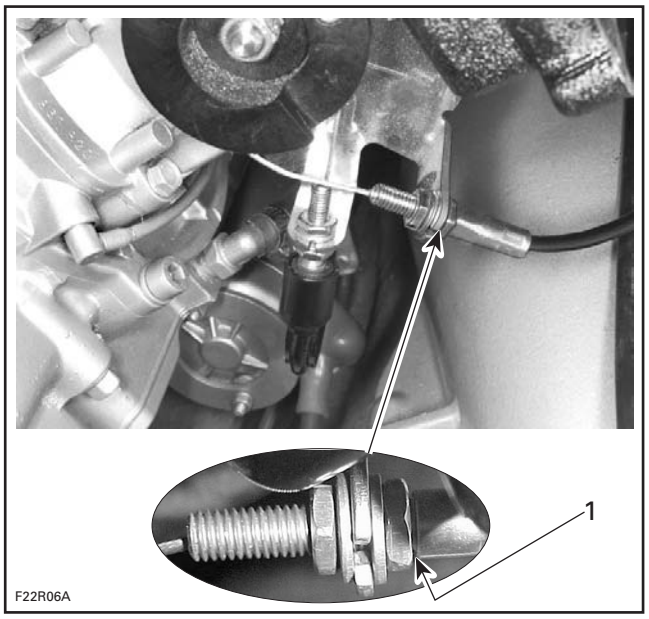
TYPE OF CONNECTION	ADAPTER TO USE	PROTOCOL TO CHOOSE
Through DESS post	DESS adapter (P/N 529 035 684)	DESS
Through 6-pin DESS connector	RFI DESS adapter (P/N 278 001 978)	

ADJUSTMENT

THROTTLE CABLE ADJUSTMENT

NOTE: For throttle cable replacement, refer to STEERING SYSTEM.

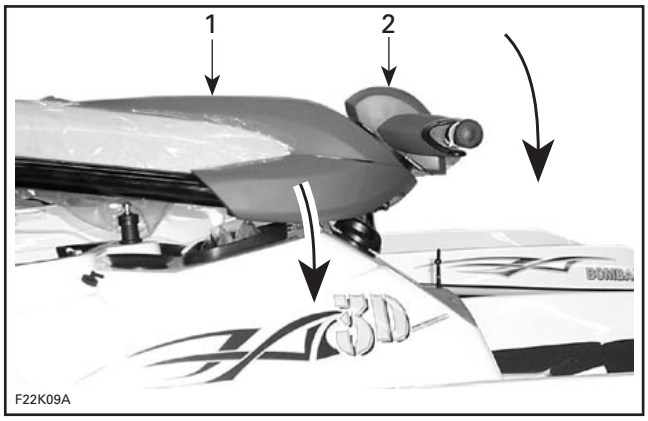
Right throttle cable adjustment is to be done at the adjuster on top of steering pole. However, first ensure adjuster at throttle body is fully screwed in.



1. Adjuster fully screwed in

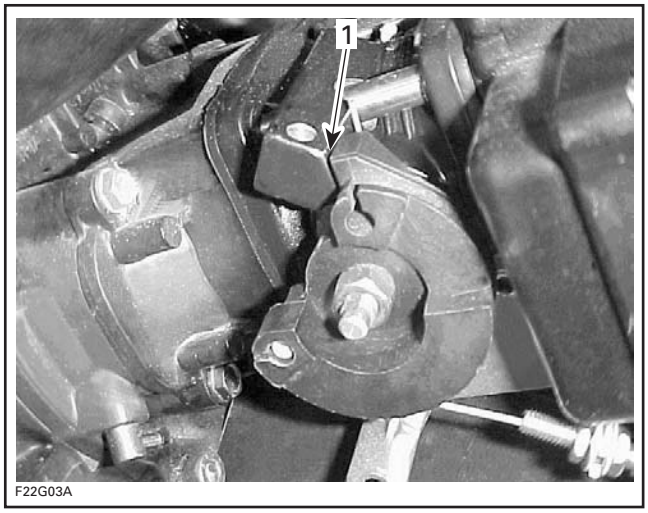
Otherwise, set it. Whenever adjuster is set at the throttle body, the throttle cable must be adjusted at the OTAS solenoid. Refer to INSTRUMENTS AND ACCESSORIES for the procedure.

Position steering pole and handlebar to their lowest position. Place handlebar in the straight ahead position.



1. Steering pole at its lowest position
2. Handlebar at its lowest position and in straight ahead position

Fully depress throttle lever and hold. Throttle lever stopper should almost contact throttle body. To ensure there is free play, apply a light pressure on the throttle plate, a slight play should be obtained.



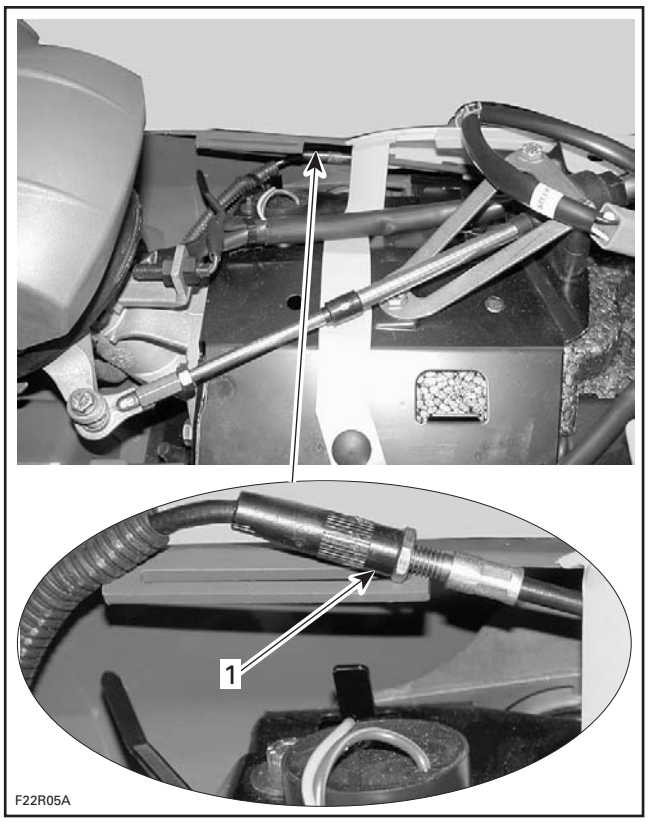
1. Free play here

CAUTION: Improper cable adjustment will cause strain on cable and/or damage cable bracket or throttle lever at handlebar.

When released, throttle lever must have a free play of 1 - 7 mm (1/32 - 9/32 in).

To adjust cable, remove top cover of steering pole. Refer to STEERING SYSTEM.

Set cable with the adjuster.



1. Cable adjuster

NOTE: When throttle cable is adjusted from this adjuster, there is no need to readjust throttle cable at the OTAS solenoid.

Reinstall removed parts.

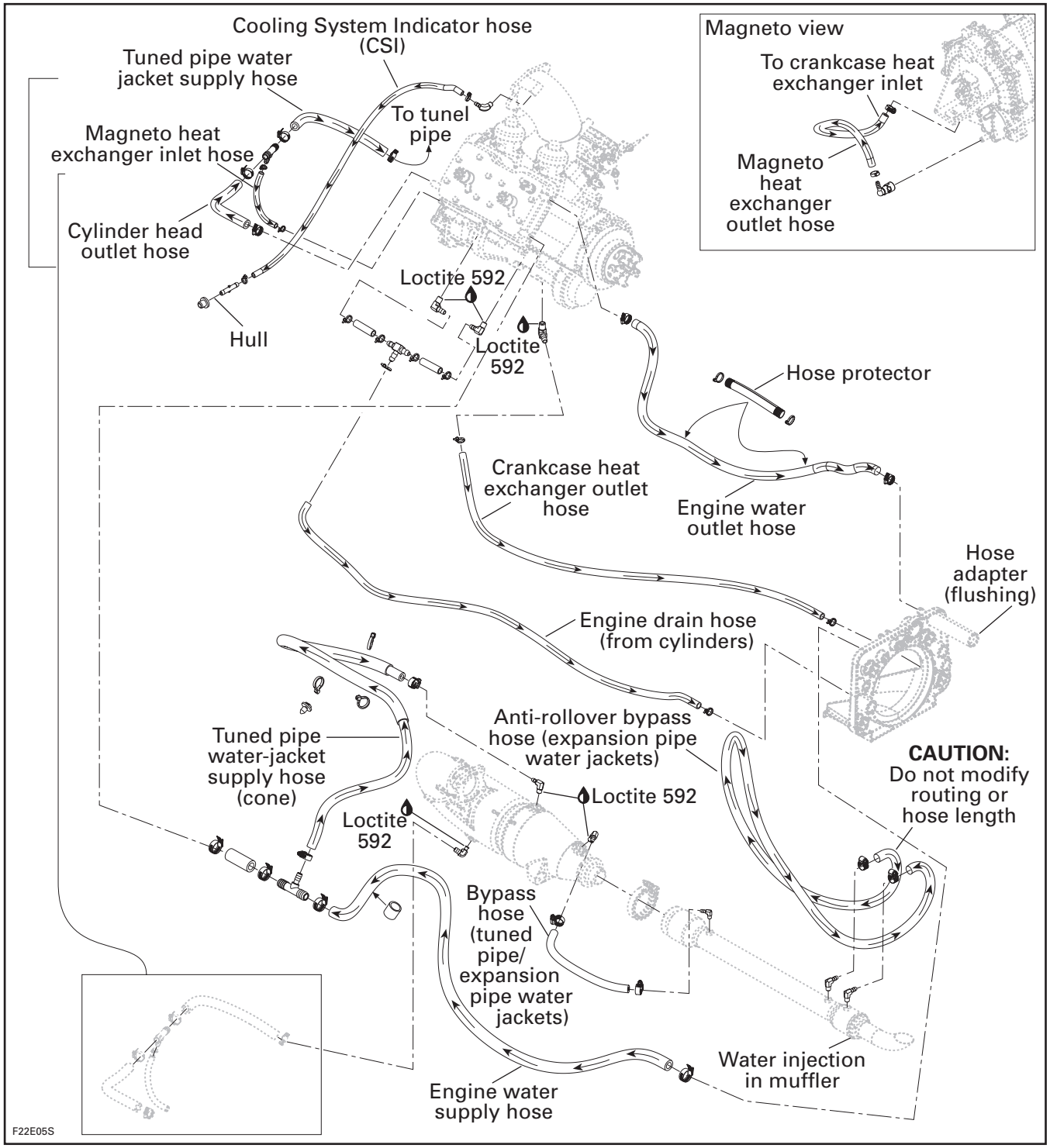
Reset the Closed TPS.

Ensure the OTAS system works adequately. Refer to INSTRUMENTS AND ACCESSORIES.

NOTE: It is not necessary to adjust the oil injection pump cable after throttle cable adjustment. It is not changed when throttle cable is adjusted.

CIRCUIT, COMPONENTS AND CARE

3D RFI


Cooling System Indicator hose (CSI)
Tuned pipe water jacket supply hose
To tunel pipe
Magneto heat exchanger inlet hose
Cylinder head outlet hose
Hull
Loctite 592
Loctite 592
Magneto view
To crankcase heat exchanger inlet
Magneto heat exchanger outlet hose
Hose protector
Crankcase heat exchanger outlet hose
Engine water outlet hose
Hose adapter (flushing)
Engine drain hose (from cylinders)
Anti-rollover bypass hose (expansion pipe water jackets)
Tuned pipe water-jacket supply hose (cone)
Loctite 592
Loctite 592
CAUTION: Do not modify routing or hose length
Bypass hose (tuned pipe/ expansion pipe water jackets)
Water injection in muffler
Engine water supply hose
F22E05S

CIRCUIT

CAUTION: All hoses and fittings of the cooling system have calibrated inside diameters to assure proper cooling of the engine. Always replace using appropriate Bombardier part number.

CAUTION: Never modify cooling system arrangement, otherwise serious engine damage could occur.

The tuned pipe and the expansion pipe have a water jacket to control the exhaust system temperature.

The water from the expansion pipe water jacket is injected into the muffler to cool it (last part of the expansion pipe water jacket has internal holes).

TECHNICAL DATA	
TYPE	TLCS (Total Loss Cooling System).
COOLANT FLOW	Flow from impeller housing (no water pump).
TEMPERATURE CONTROL	Calibrated outlet fittings (no thermostat).
SYSTEM BLEEDING	Self-bleed type (hose at uppermost point of circuit).
SYSTEM DRAINING	Self-drain type (hose at lowest point of circuit).
SYSTEM FLUSHING	Hose adapter.
MONITORING BEEPER	Turns on at 86 - 94°C (187 - 201°F).

COMPONENTS

Due to the dry pipe design (no water injection in tuned pipe) of this watercraft, there is no water flow regulator valve as found on other 787 RFI watercraft.

CARE

For flushing purposes, the cooling system is equipped with a hose adapter.

A garden hose is used to flush the whole system by backwash. For flushing procedure, refer to FLUSHING AND LUBRICATION in the Shop Manual.

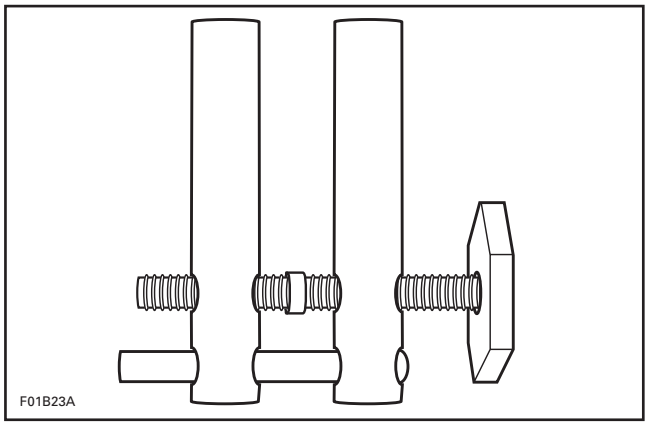
For winterization of cooling system, refer to STORAGE.

TOWING THE WATERCRAFT IN WATER

Special precautions should be taken when towing a Sea-Doo 3D watercraft in water.

Maximum recommended towing speed is 24 km/h (15 MPH).

When towing your watercraft in water, pinch the water supply hose from the jet pump housing to the engine with a large hose pincher (P/N 529 032 500).

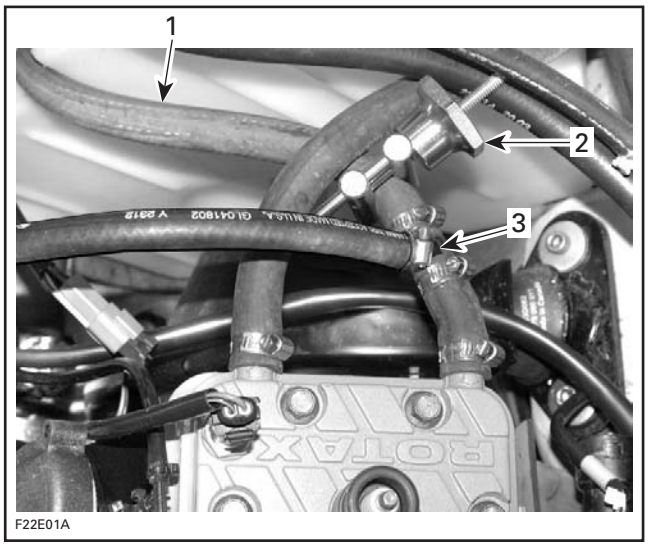


This will prevent the cooling system from filling which may lead to water being injected into and filling the exhaust system. Without the engine running there isn't any exhaust pressure to carry the water out the exhaust outlet.

CAUTION: Failure to do this may result in damage to the engine. If you must tow a stranded watercraft in water and do not have a hose pincher be sure to stay well below the maximum towing speed of 24 km/h (15 MPH).

Snugly install the hose pincher on the water supply hose as shown in the following illustration.

NOTE: Pinch the hose with the red tape.



1. Engine water supply hose
2. Hose pincher this side of T-fitting
3. T-fitting

CAUTION: When finished towing the watercraft, the hose pincher must be removed before operating it.

FUEL CIRCUIT

Fuel Tank Removal and Installation

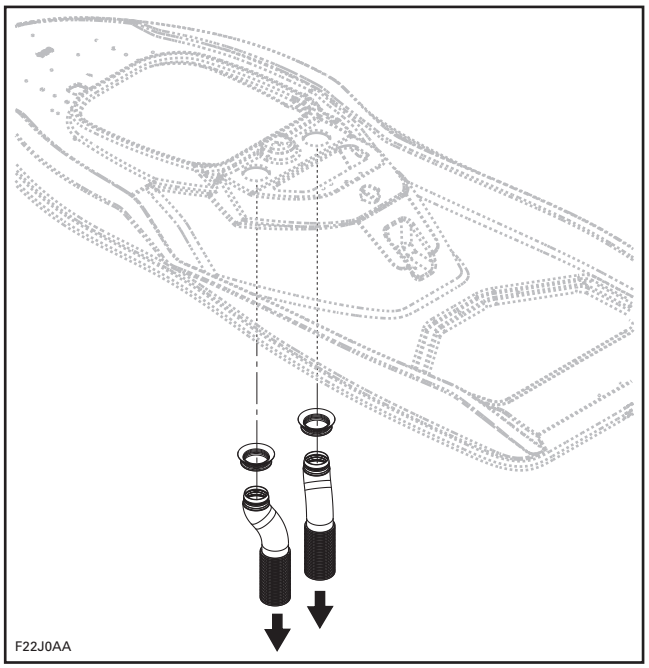
The engine removal is necessary to remove fuel tank.

Disconnect battery.

⚠ WARNING

Always disconnect BLACK negative cable first.

Pull out both vent tubes.



Remove ignition coils.

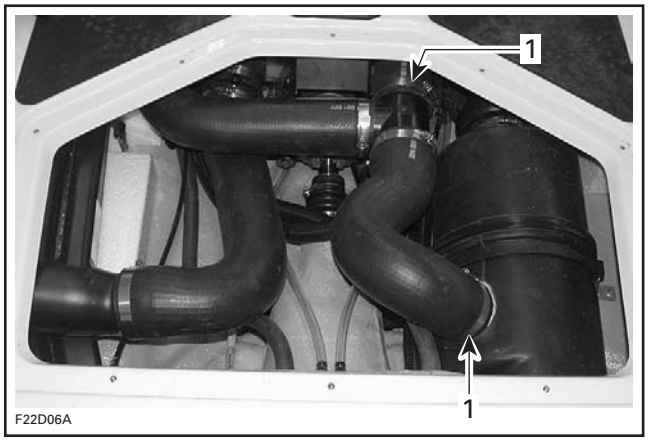
Disconnect fuel hoses. Refer to RFI ENGINE MANAGEMENT in the Shop Manual.

Disconnect fuel pump wire harness.

Siphon fuel tank.

Remove electric fuel pump.

To have access to the rear fuel tank holding strap, remove exhaust hoses with the resonator.



1. Loosen clamps and pull out hoses with resonator

Detach all 3 fuel tank straps.

Pull out fuel tank.

Installation is essentially the reverse of removal procedure.

⚠ WARNING

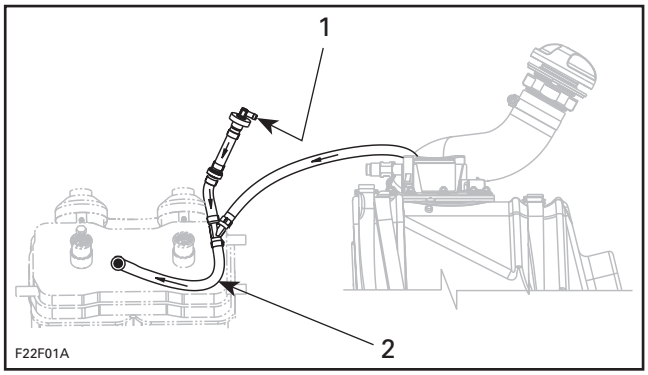
Whenever doing any type of repair on watercraft or if any components of the fuel system are disconnected, a pressure test must be done before starting engine. Ensure to verify fuel line ends for damage. Always cut damaged end before reinstallation.

Fuel System Pressurization

Proceed as follows:

– Fill up fuel tank (recommended but not mandatory).
– Install a hose pincher (P/N 295 000 076) on fuel tank vent hose.
– Connect pump gauge tester (P/N 529 021 800) to air inlet hose fitting.

NOTE: This pump is included in the ENGINE LEAK TESTER KIT (P/N 295 500 352).



1. Connect pump to air inlet fitting
2. Install hose pincher on this hose

– Pressurize fuel system to 34 kPa (5 PSI).
– If pressure is not maintained locate leak and repair/replace component leaking. To ease leak search spray a solution of soapy water on components, bubbles will indicate leak location.

NOTE: The system must maintain a pressure of 34 kPa (5 PSI) during 10 minutes. Never pressurize over 34 kPa (5 PSI).

⚠ WARNING

If any leak is found, do not start the engine and wipe off any fuel leakage. Do not use electric powered tools on watercraft unless system has passed pressure test.

Remove hose pincher from fuel tank vent hose. Make sure pressure is dropping on pump gauge tester.

NOTE: Pressure drop indicates that relief valve and the outlet fitting are not blocked.

Remove the pump gauge tester from the air inlet hose fitting.

High Pressure Test (fuel pump circuit)

Install safety lanyard on DESS post to activate fuel pump. Check for any leakage at fuel rail, injectors and fuel hose.

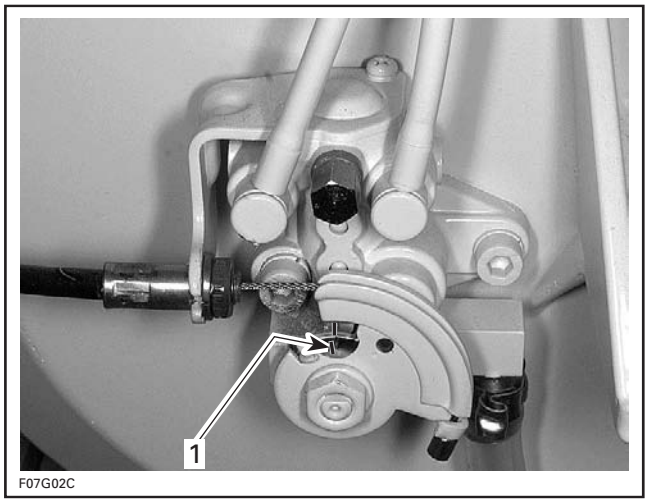
OIL INJECTION PUMP

ADJUSTMENT

NOTE: On the 3D RFI, if the throttle cable is readjusted, it does not change the oil injection pump adjustment.

CAUTION: Proper oil injection pump adjustment is very important. Any delay in the opening of pump can result in serious engine damage.

The oil injection pump should be adjusted as follows; the mark on the pump lever should be offset (richer side) by 1 mm (.039 in) with the other mark on the pump housing.



1. Mark on pump lever offset by 1 mm (.039 in)

CHARGING SYSTEM

GENERAL

Fuse

If the battery is regularly discharged, check fuse condition.

The rectifier/regulator could be the culprit of a blown fuse. To check, simply disconnect the rectifier/regulator from the circuit.

If the fuse still burns, check for a defective wire.

CAUTION: Do not use a higher rated fuse as this cause severe damage.

NOTE: Since charging current flows through the main fuse, check its condition.

The main fuse is located beside the VCM.

1. VCM
2. Main fuse

TESTING PROCEDURE

NOTE: First, ensure that battery is in good condition prior to performing the following tests.

Rectifier/Regulator

STATIC TEST: CONTINUITY

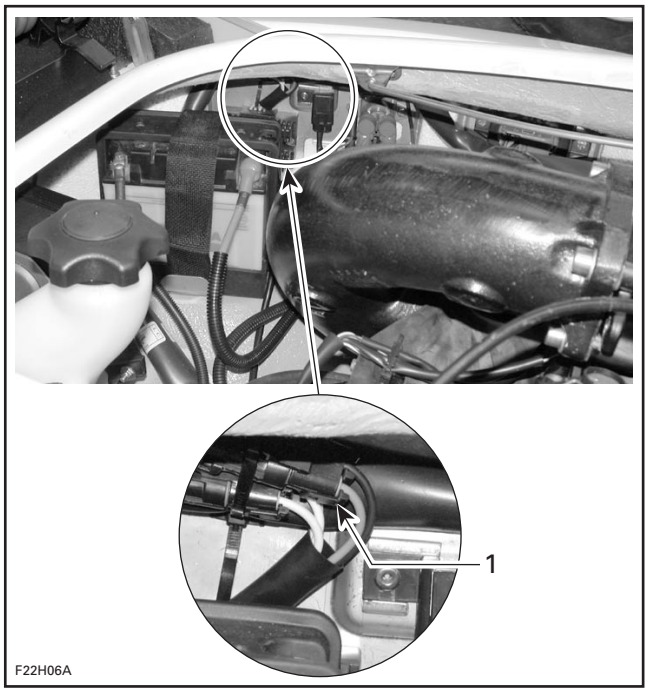
Due to internal circuitry, there is no static test available.

DYNAMIC TEST

Current Test

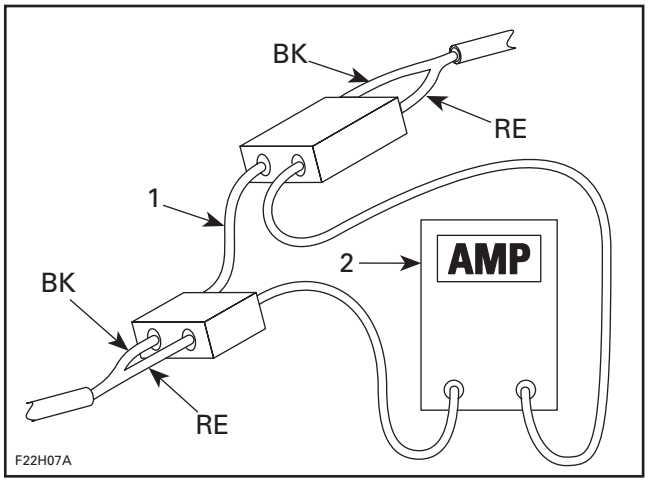
Proceed as follows:

Unplug the 2-pin rectifier/regulator connector.



1. 2-pin connector

– Insert a jumper wire across the black wire terminals of open connectors.
– Connect an ammeter across the RED wires of open connectors.



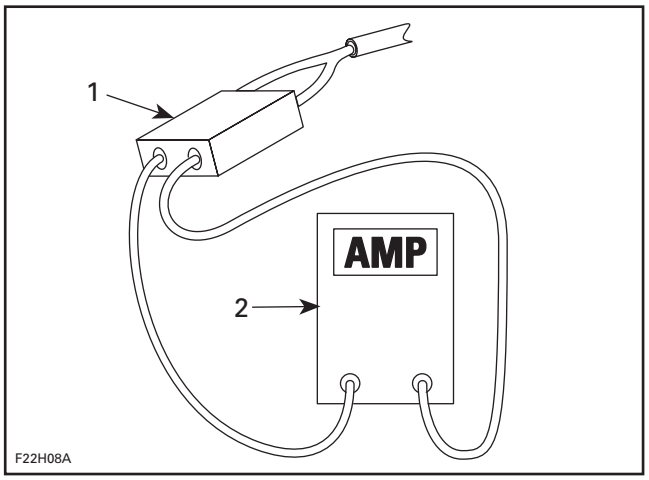
1. Jumper wire
2. Ammeter

– Start engine.
– Bring engine to approximately 6000 RPM.

– Note the reading. This is the current supplied by the regulator.
– Remove jumper wire and reconnect the 2-pin connector.

Remove the main fuse from its holder:

– Connect an ammeter across the fuse holder.



1. Main fuse holder
2. Ammeter

– Start engine.
– Bring engine to approximately 6000 RPM.
– Note the reading. This is the current actually consumed
– Reinstall fuse.

Substract the consumed current from the regulator current. This gives the current supplied by the regulator. It should be within 3 - 4 A.

CHARGING CURRENT = CURRENT FROM REGULATOR - CONSUMED CURRENT

If charging current is below specification, check magneto output. If the magneto output is good, try another rectifier/regulator. Recheck charging current. If still out of specification, the fuel pump or the MPEM current draw is too high.

If charging current exceeds specification, replace the rectifier/regulator.

DC Voltage Test

Proceed as follows:

– Start engine.
– Connect a multimeter to battery posts. Set multimeter to Vdc scale.
– Bring engine to approximately 5500 RPM.

If multimeter reads over 15 volts, regulator is defective. Replace it.

NOTE: If it is continually necessary to add distilled water to the battery, this indicates an over voltage situation, requiring replacement of the rectifier/regulator. If, on the other hand, the battery will not stay charged, the problem can be any of the charging circuit components. If these all check good, you would be accurate in assuming the problem to be in the rectifier/regulator.

If there is no charging at the battery with the preceding voltage test, the following test can also be performed.

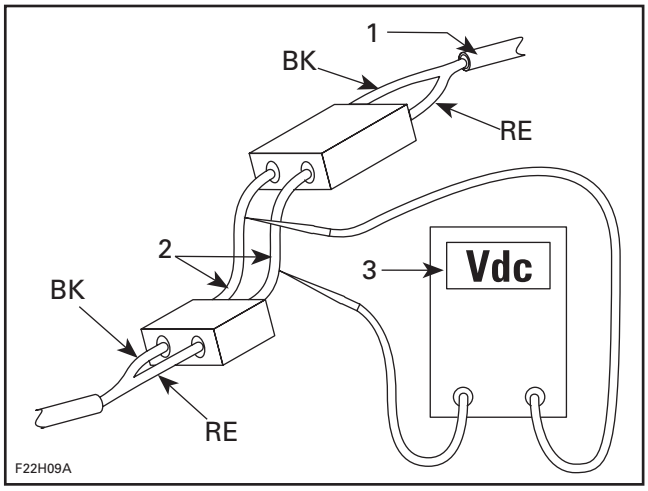
Disconnect the connector housing of the rectifier/regulator.

Using an appropriate terminal remover (Snap-on TT600-4), remove the RED and BLACK wires from the tab housing of the rectifier/regulator.

Reconnect the connector housing.

Connect the positive probe of a multimeter to the RED wire and the negative probe to the BLACK wire.

Set multimeter to Vdc scale.



1. Connector removed on rectifier/regulator side
2. Wires connected to remaining connector
3. Voltmeter

Start and rev engine to 3500 RPM. The obtained value should be between 12 and 25 Vdc.

NOTE: If the rectifier/regulator is within the specification, either the MPEM or wiring harness between the rectifier and battery is defective. If the rectifier/regulator is out of specification and the battery charging coil (or stator) test good, the rectifier/regulator is defective.

Properly reinstall terminals in connector and plug connectors.

STARTING SYSTEM

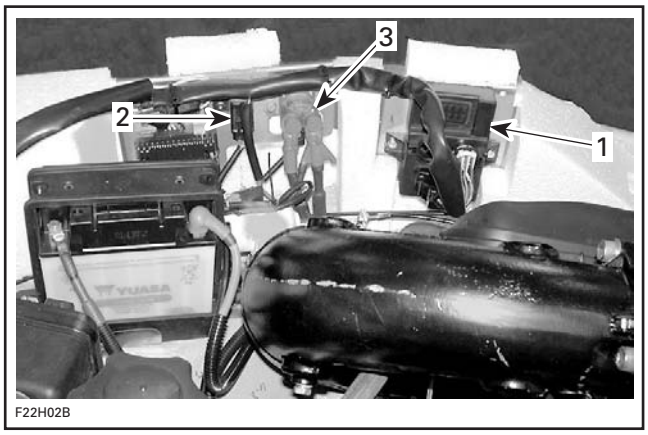
GENERAL

Fuse

Make sure the following fuses are in good condition.

5 A fuse on the MPEM.

Main fuse besides the VCM.



1. VCM
2. Main fuse
3. Starting solenoid

Solenoid

NOTE: Solenoid is located besides the VCM. See illustration above.

INSTRUMENTS AND ACCESSORIES

GENERAL

Install safety lanyard to activate MPEM and VCM to perform testing procedures that requires the device to be supplied with electricity.

VEHICLE CONTROL MODULE (VCM)

The VCM is directly powered by the battery through the 20A main fuse.

The following electrical system functions are controlled by the VCM:

– power supply cut-off
– indicator light cluster
– electric bilge pump
– off-throttle assisted steering (OTAS)

Power Supply Cut-Off

When the safety lanyard is on its switch, the VCM internal relay allows current to be supplied from the battery to the RED/PURPLE wire which supplies the MPEM and its dependent components. Simultaneously, the VCM supplies its own dependent components. Refer to WIRING DIAGRAMS section.

When the safety lanyard is NOT on its switch, the internal relay cuts the current supply from the battery and thus prevents current drain that would slowly discharge the battery.

Test the signal wire to the power supply cut-off relay as follows:

Disconnect DESS switch wires.

Connect test probes to switch BLACK and BLACK/PURPLE wires.

With safety lanyard NOT on its switch: Measure resistance. There should be NO continuity (open circuit). Otherwise replace DESS switch.

With safety lanyard INSTALLED on its switch: Measure resistance. There should be continuity. Otherwise replace DESS switch.

Reconnect DESS connector.

If switch tests good in both checks, do the following.

Disconnect the AMP connector #3 from MPEM.

Using a voltmeter, perform the following test:

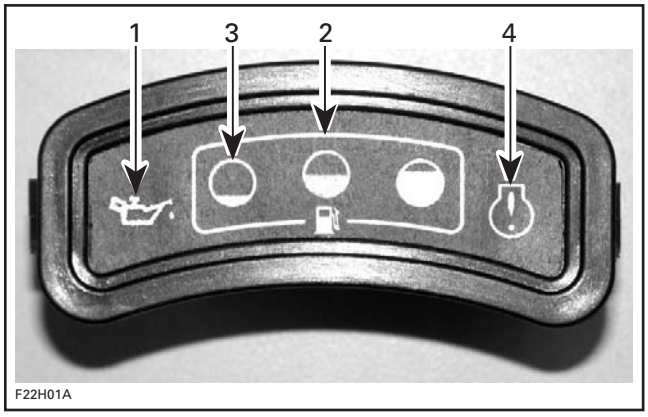
Connect one test probe to the harness connector at pin 26 and the other probe to the battery ground.

Reading should be 0 V when safety lanyard is removed. Otherwise, replace the VCM.

Keeping the test probes at the same position, install safety lanyard to DESS post. Measure voltage. Reading should be above 10 V. Otherwise, check wiring and if it is good, replace the VCM.

If there is no current supply to the electrical components while the DESS switch and the VCM test good, check the wiring harness going to the component and the component itself. If it tests good, the MPEM could be suspected. Try a new one.

Indicator Light Cluster



1. Low oil warning light
2. Fuel level lights
3. Low fuel level light
4. Warning light

NOTE: When safety lanyard is installed, the fuel pump will be activated for 1 second to build up pressure in the fuel injection system.

The low oil warning light will turn on whenever oil level is low in reservoir.

CAUTION: Always replenish oil reservoir as soon as possible to avoid serious engine damage.

When safety lanyard is installed and fuel tank is full, all lights are continuously turned on. As fuel level goes down, the fuel level lights will turn off one at a time to indicate remaining fuel.

As a reserve indicator, the beeper will turn on when approximately 6 L (1.6 U.S. gal.) is left and the low level light will continuously blink. It will turn off when approximately 3 L (.8 U.S. gal.) is left. Refer to the DIGITALLY ENCODED SECURITY SYSTEM (DESS) section for the coded signals.

The warning light will turn on whenever there is a problem with the engine management system. It will blink when there is a problem with the O.T.A.S.™ system or the electric bilge pump.

NOTE: When engine is not running and safety lanyard is on its post, the warning light will remain turned on until safety lanyard is removed.

Lights Verification

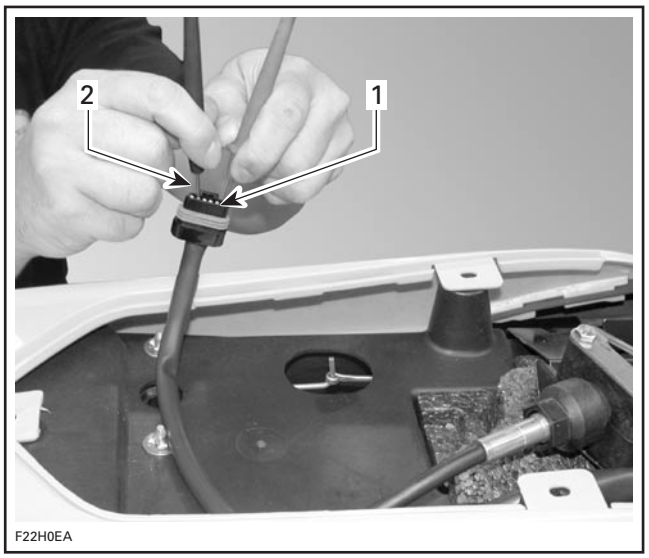
When installing safety lanyard, all lights will turn on for a brief moment. This confirms their operation.

Otherwise, remove steering pole cover (refer to BODY) and unplug cluster connector.

Individually validate the lights supply from VCM as follows:

NOTE: The PURPLE wire is the common power wire.

– Install safety lanyard.
– Read voltage between PURPLE wire and every other wire.



1. Common supply PURPLE wire
2. Probe other terminals individually

NOTE: Perform the voltage reading quickly before the VCM stops sending the test signal to the lights. Reinstalling safety lanyard will re-initialize the VCM.

– Battery voltage should be read. Otherwise, check wiring. If wiring tests good, try a new VCM.
– If battery voltage is read, check connector and if good, replace the indicator light cluster.

Electric Bilge Pump

When safety lanyard cap is installed on its post, the bilge pump is automatically turned on. It will remain on until all water is evacuated (if so), then it will shut down automatically. Then, the pump will start every 10 seconds to perform this cycle.

Voltage Test

Remove rear access panel and disconnect connector from bilge pump.

Install safety lanyard on its post.

Using a voltmeter, measure voltage between wires of connector coming from vehicle harness. Battery voltage should be read.

If so, replace bilge pump. Otherwise, check wiring. If wiring tests good, try a new VCM.

Off-Throttle Assisted Steering (O.T.A.S.)

The O.T.A.S. (Off-Throttle Assisted Steering) system provides additional maneuverability in off-throttle situations. The O.T.A.S. system is electronically activated and slightly increases engine speed under a pre-programmed RPM when the driver initiates a full turn. When handlebar is brought back to its center position, the throttle reverts to idle.

Run Test

This test is to be performed with the watercraft in the water (regular riding or jet pump in water with watercraft attached on a trailer and using a tachometer).

– Make sure the path ahead is clear.
– Raise engine RPM higher than 4000 RPM for more than 1 second.
– Release throttle while steering is in the straight ahead position.
– Within 1 to 3 seconds, turn handlebar all the way to one side.

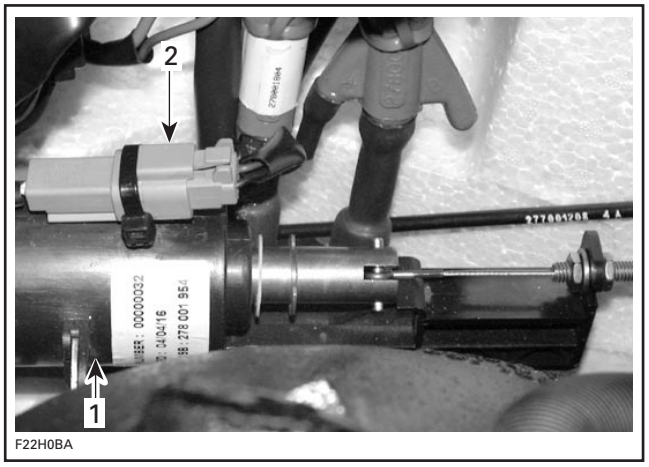
– The O.T.A.S. should come on for 1/2 second and increase engine RPM within 2900 to 3900.
– If steering is kept in this position, the O.T.A.S. will come on again every 2 seconds.
– Turn handlebar to other side quickly (within 1/2 second).
– The O.T.A.S. should still be active and come on every 2 seconds.

If the RPM is not within the specified range, perform the O.T.A.S. THROTTLE CABLE ADJUSTMENT as described below.

If the RPM does not change, perform the STEERING POSITION SWITCH tests. See below.

Solenoid Test

Unplug connector close to solenoid.

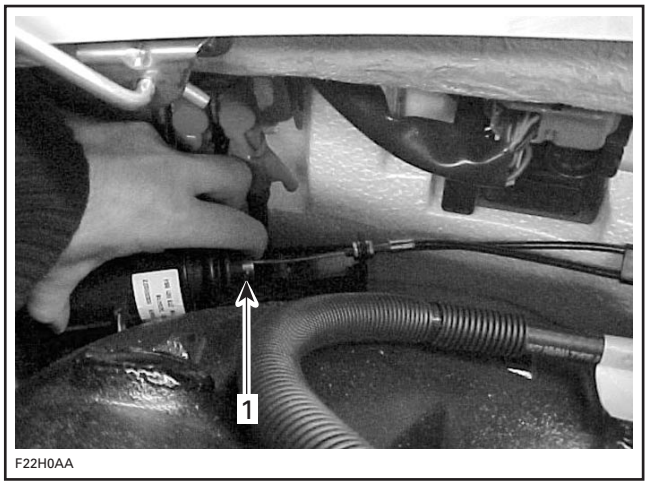


F22H0BA

1. OTAS solenoid beside VCM
2. Solenoid connector

Connect temporary jumper wires to the solenoid connector using wires long enough to go outside bilge.

Apply 12V to the jumper wires. Solenoid should pull on the throttle cable and hold it. Also try to push on solenoid rod to make sure it is fully collapsed.



F22H0AA

1. Pushing on solenoid rod

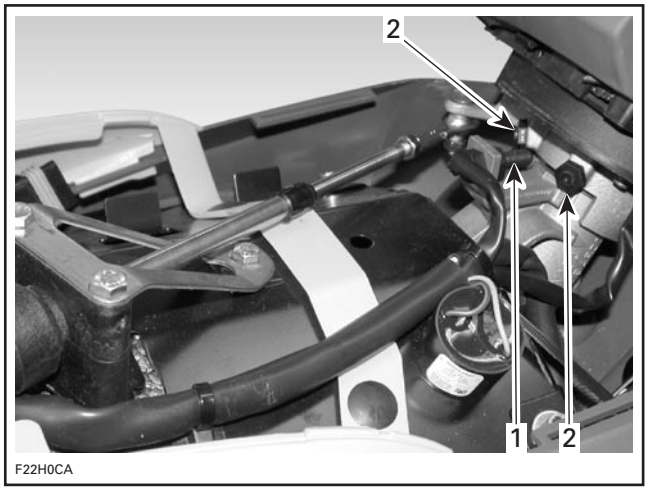
If solenoid fails any test, replace solenoid.

⚠ WARNING

Whenever solenoid is replaced, ensure to perform throttle cable adjustment at the solenoid.

If solenoid tests good, proceed with the sensor test.

Steering Position Switch Test

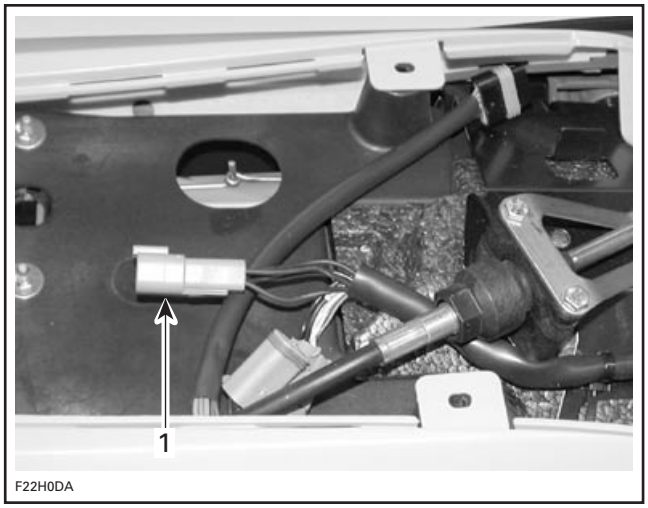


F22H0CA

1. Steering position switch
2. Magnet

Remove steering pole cover. Refer to BODY section.

Disconnect the switch 4-pin connector.



1. 4-pin connector

Perform the following tests for left and right sides.

Using an ohmmeter, probe the BLACK/WHITE and BLACK wires of switch while steering is roughly at its center position.

Resistance should be 470Ω. Otherwise, check wiring harness and if good, replace switch.

Turn steering until it is blocked by its stopper. Keep steering in this position.

Resistance should be 82Ω.

Otherwise, try any magnet and bring it in front of the switch. If resistance is now good, replace magnet.

If both resistance tests are good, check wiring harness and if good, try a new VCM.

Reinstall steering pole cover.

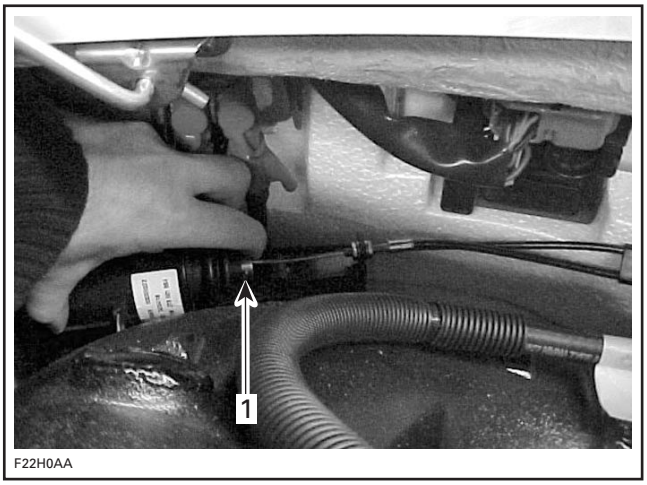
O.T.A.S. Throttle Cable Adjustment

⚠ WARNING

Whenever solenoid or throttle cable has been replaced, ensure to perform the O.T.A.S throttle cable adjustment. Strictly follow the described procedure.

The procedure consists of manually pushing the solenoid rod (which pulls the throttle cable and activates the throttle plate) while reading the TPS opening or resistance value depending on the tool used.

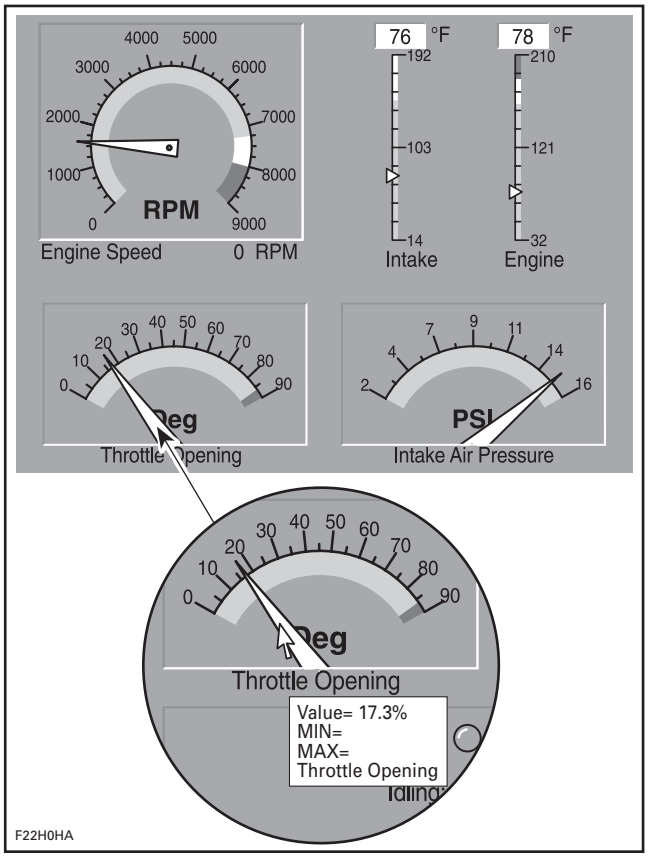
Fully push the solenoid rod in and HOLD (simulating the electrical activation) while reading the value.



1. Push and HOLD solenoid rod

Use BUDS with the VCK and look in Throttle Opening under Monitoring tab. Adjust cable at solenoid bracket to get a value of 17.3% +/-1

NOTE: In BUDS, position and hold the mouse pointer over the needle of the throttle opening to get the actual value.



THROTTLE OPENING GAUGE IN BUDS

Alternately, the MPEM Programmer can be used. Adjust throttle opening to get a value of 18.4° +/-1.

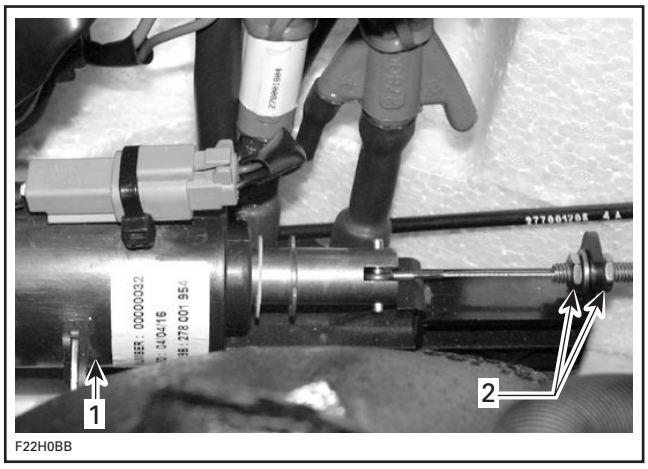
If none of these tools are available, resistance can be measured with an ohmmeter on wires going to the TPS.

Disconnect the AMP connector #4 from the MPEM.

Measure and note resistance between pins 4 and 11 of TPS wiring while at the idle position.

Push in solenoid rod and HOLD. Measure resistance again.

Adjust cable at solenoid bracket to get an increased resistance value of 165Ω.



1. OTAS solenoid
2. Adjust here

MULTI-PURPOSE ELECTRONIC MODULE (MPEM)

The MPEM is powered by the battery through the VCM. It has a micro-processor inside of its sealed case.

Most of the electrical system is controlled by the MPEM. It is in charge of the following electrical functions:

– interpreting information
– distributing information
– start/stop function
– Digitally Encoded Security System
– ignition timing curve
– engine rev limiter.

Some fuses are directly mounted onto the MPEM.

The MPEM features a permanent memory that will keep the programmed safety lanyard(s) active and other vehicle information, even when the battery is removed from the watercraft.

MPEM Functions

Safety Lanyard Reminder

If engine is not started within 5 seconds after installing the safety lanyard on its post, 4 short beeps every 3 second interval will sound for approximately 2 hours to remind you to start the engine or to remove safety lanyard. Afterwards, the beeps will stop. The same will occur when safety lanyard is left on its post 5 seconds after engine is stopped.

Always ensure safety lanyard is not left on its post after engine is stopped.

IMPORTANT: Leaving the safety lanyard on its post when engine is not running will slowly discharge the battery.

Antistart Feature

When connecting a safety lanyard cap on the switch the DESS system inside the MPEM is activated and will emit audible signals:

– 2 short beeps indicate a right safety lanyard is being used and gauges are supplied with current for 33 seconds. The MPEM will thus allow the engines to start.
– 1 long beep indicates a wrong safety lanyard is being used or that the anti-start feature is defective. Current to gauges is cut after the audible signal is emitted and the engine cannot be started.

A wrong safety lanyard is a safety lanyard which is defective or not programmed in the MPEM memory.

To better understand the anti-start feature, refer to DESS (DIGITALLY ENCODED SECURITY SYSTEM).

If the MPEM responds differently from what is mentioned above, refer to the troubleshooting section to find out why.

Engine Starting

If the MPEM recognizes a valid safety lanyard, it allows engine to start when the start/stop switch is pressed.

If start/stop button is held after engine has started, the MPEM automatically stops the starter when the engine speed reaches 1000 RPM.

Engine RPM Limiter

The MPEM will limit the maximum engine speed.

Engine Stopping

There are two ways to stop the engine.

Press start/stop switch or remove the safety lanyard cap from the switch.

Power Distribution

The MPEM distributes power from the battery to most components. Refer to WIRING HARNESS.

Overheat Sensor

When the engine temperature reaches a threshold value, the MPEM triggers a continuous beep to indicate overheating.

Diagnostic Mode

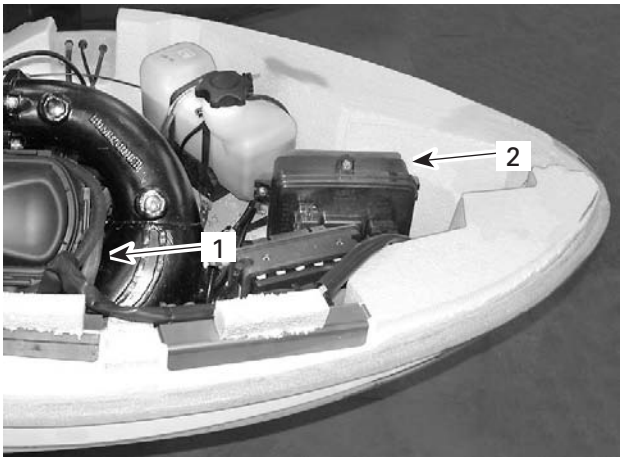
In order to facilitate the use of the watercraft, a system controls the digitally encoded security system (DESS) and sends, through a buzzer, some audible signals informing the operator of a specific situation. The diagnostic mode is automatically activated when connecting the safety lanyard cap to the switch. Refer DIGITALLY ENCODED SECURITY SYSTEM.

Fuses

Components are protected by fuses integrated in the MPEM and in fuse holder close to VCM. Fuses are identified beside their holder. See below for fuses location and description.

MPEM

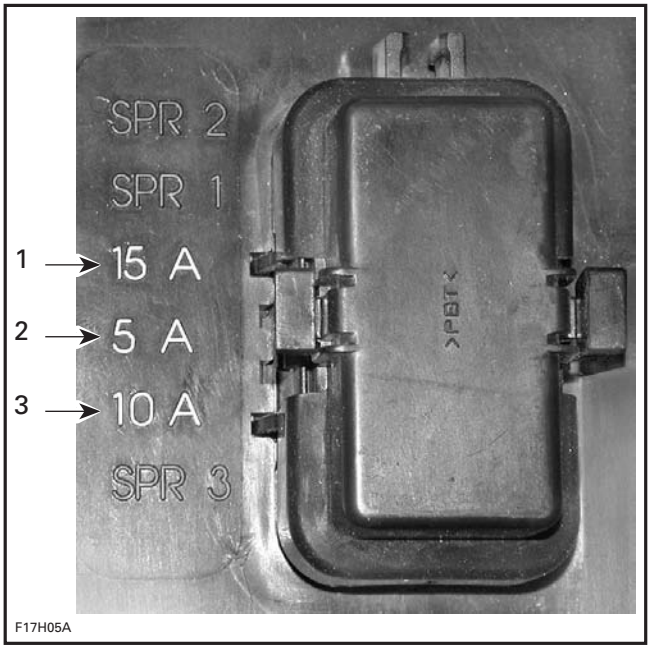
Locate the MPEM in front of engine.



F22H03A

1. Engine
2. MPEM

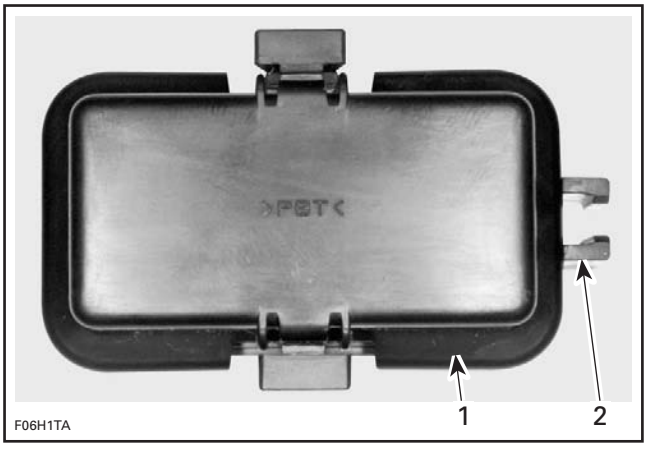
Fuse ratings are identified on the MPEM. Look for them beside the fuse holder. SPR means spare (fuse).



1. 15 A (battery)
2. 5 A (MPEM)
3. 10 A (fuel pump)

Remove fuse cover from MPEM.

Use the tabs of the fuse cover to remove and re-install fuses.



1. Fuse cover
2. Fuse tabs

Main Fuse

The main fuse is located beside the VCM.

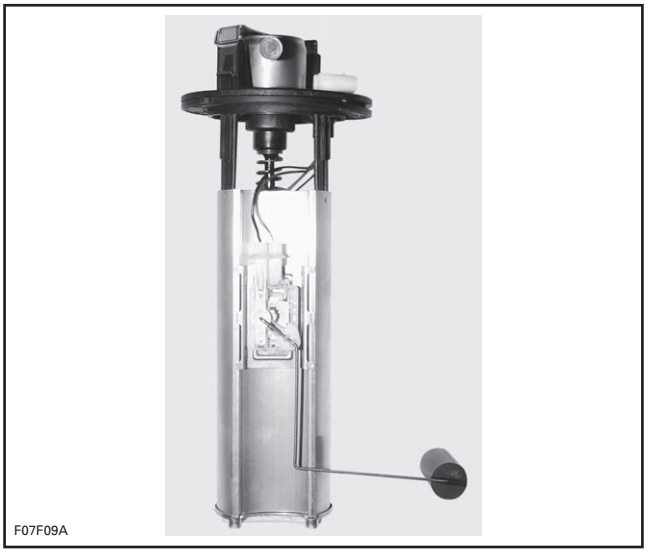
1. VCM
2. Main fuse

INSPECTION

Fuel Baffle Pick-Up Sender

The fuel pick-up system is part of the fuel pump module mounted inside the fuel reservoir.

The fuel level gauge sender is also mounted on this module.



TYPICAL — FUEL LEVEL GAUGE SENDER MOUNTED ON FUEL PUMP MODULE

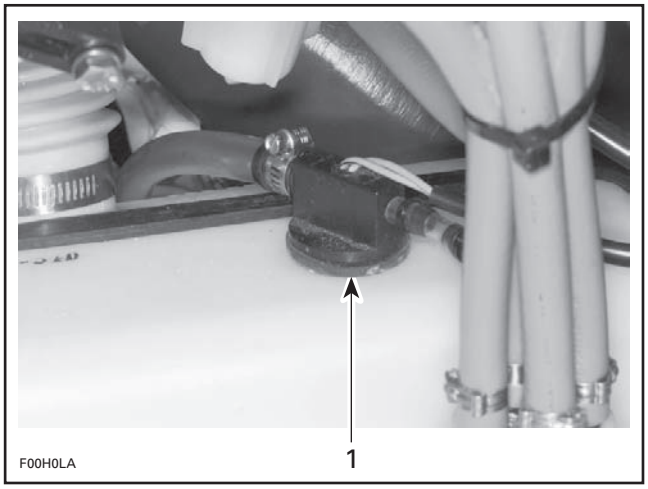
Refer to ENGINE MANAGEMENT for fuel pump testing. For fuel level sensor, follow procedures below.

The resistance measured between PINK/BLACK and PINK wires must be in accordance with fuel level (measured from under the flange) as specified in the following charts.

RESISTANCE (Ω)	FLOAT HEIGHT (bottom of float with bottom of pump module) (mm)
4.8 ± 2.2	247 ± 5.0
17.8 ± 2.2	207 ± 5.0
27.8 ± 2.2	183 ± 5.0
37.8 ± 2.2	158 ± 5.0
47.8 ± 2.2	133 ± 5.0
57.8 ± 2.4	105 ± 5.0
67.8 ± 2.8	76 ± 5.0
77.8 ± 3.6	55 ± 5.0
89.8 ± 3.6	35.3 ± 5.0

Oil Sensor

The sensor sends the signal to the VCM then to the low-oil level light in the indicator light cluster.



1. Oil sensor

The bottom of the sensor has a small reservoir with two small holes underneath to let the oil enter inside and one at the top to let the air enter allowing the oil to flow out.

When there is enough oil inside the oil tank (and therefore in the sensor reservoir), the sensor detects the liquid and the light DOES NOT turn on.

When the oil level goes at critical LOW level inside the oil tank (and therefore in sensor reservoir), the sensor detects the absence of liquid and the light TURNS ON.

To check the oil sensor, unplug its connector and pull sensor out of oil tank.

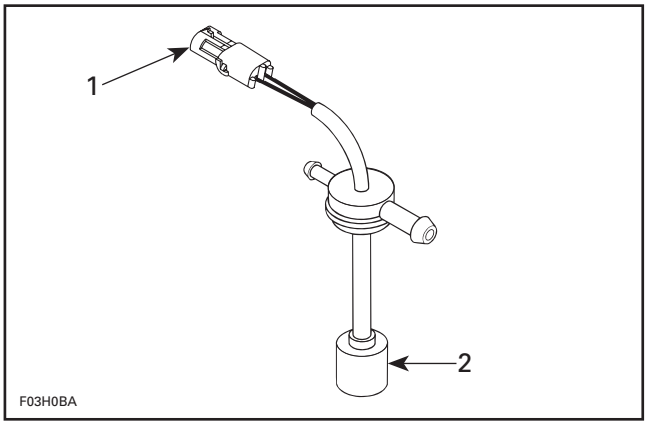
Using a multimeter, check the continuity between the BLUE and BLUE/BLACK terminals.

When sensor is out of oil tank and its reservoir is empty, resistance must be infinite (open circuit).

NOTE: Wait about 15 - 20 seconds before taking any reading to give the oil enough time to flow out or inside sensor reservoir.

Soak sensor in oil so that its reservoir fills up. Maximum resistance should be approximately 2 Ω (closed circuit).

TEST CONDITION	READING (Ω)
Sensor OUT of oil	∞ (open circuit)
Sensor soaked IN oil	2 Ω max. (closed circuit)



1. Measure resistance here
2. Sensor reservoir

To Reinstall Sensor:

– Remove rubber seal from sensor.
– Install seal in oil tank hole.
– Push sensor in seal.
– Plug connector.

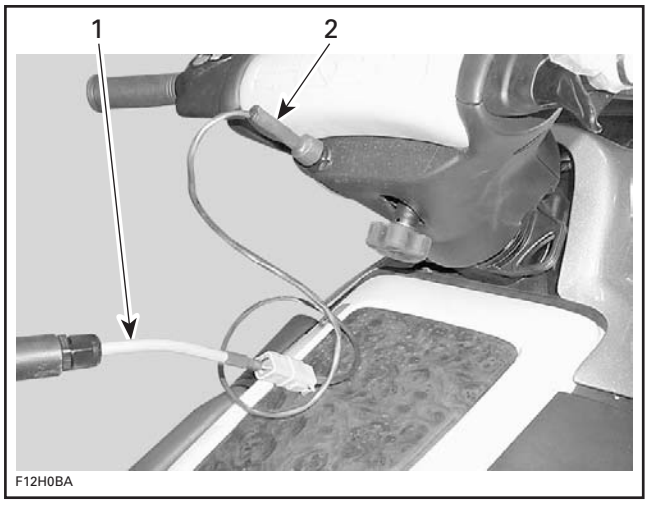
NOTE: This sensor turns the LED to ON if the connector has been forgotten unconnected even when there is enough oil in tank.

DESS (CARBURETED AND RFI ENGINES)

DESS KEY PROGRAMMING

Programming Keys with B.U.D.S.

Connect VCK components and open the software B.U.D.S.



TYPICAL
1. 6-pin adapter (P/N 529 035 679)
2. DESS adapter (P/N 529 035 684)

NOTE: It is also possible to disconnect the connector located under the top cover of steering pole and install the RFI DESS adapter (P/N 278 001 978).

1. RFI DESS adapter

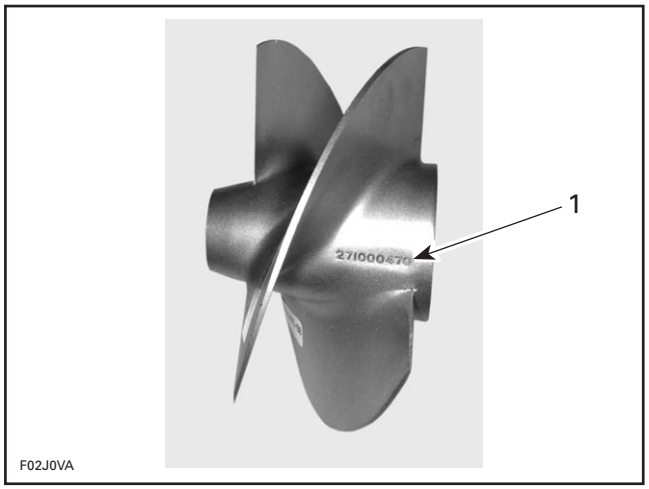
After all connections are done, connect the safety lanyard to the DESS post to activate the communication.

IMPORTANT: When using the software B.U.D.S., ensure that the protocol matching the connection used is properly selected in "**MPI**" under "**Choose protocol**" as per the following chart.

TYPE OF CONNECTION	ADAPTER TO USE	PROTOCOL TO CHOOSE
Through DESS post	DESS adapter (P/N 529 035 684)	DESS
Through 6-pin DESS connector	RFI DESS adapter (P/N 278 001 978)	

JET PUMP

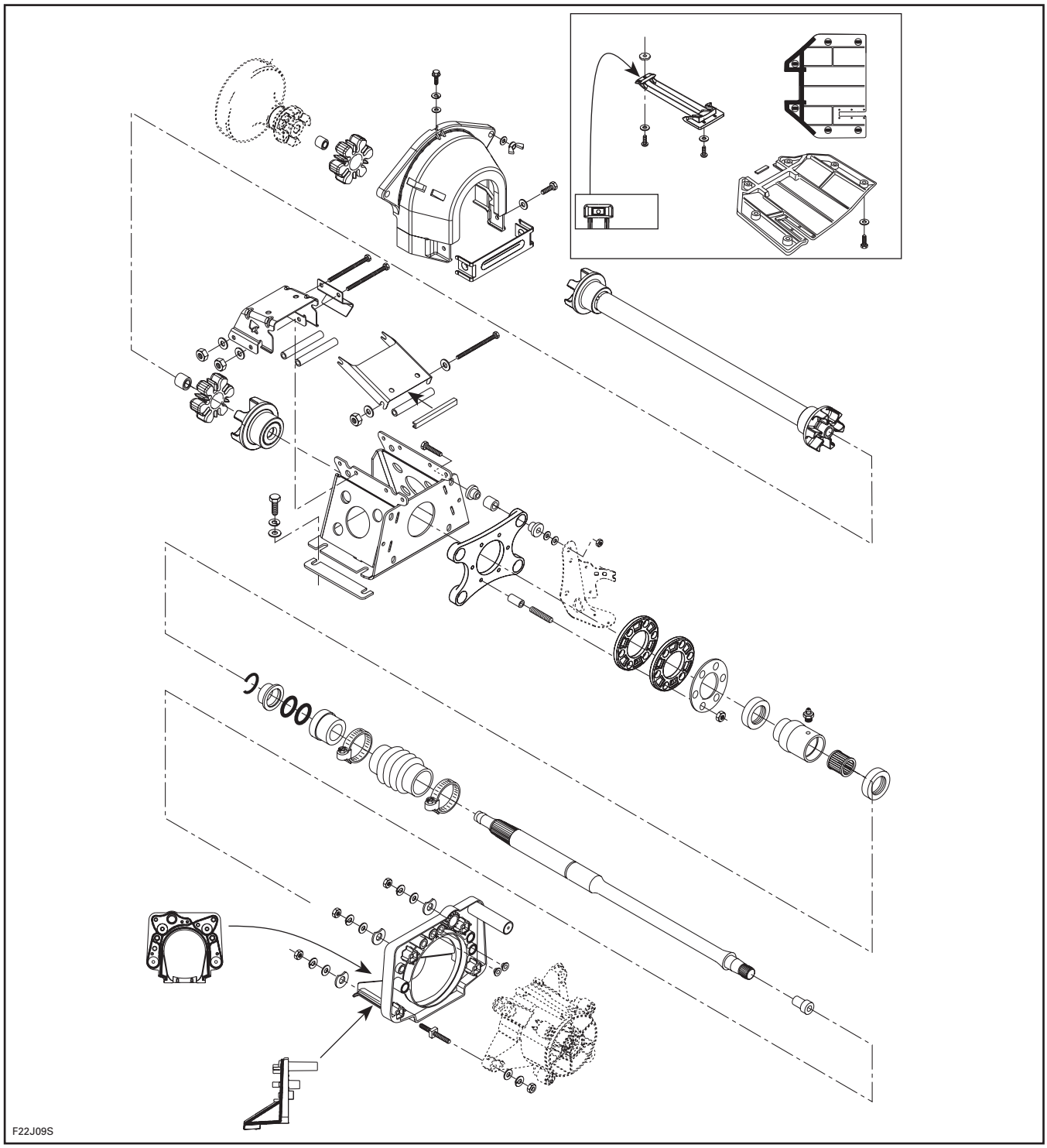
Impeller Identification



1. Stamped part number

WATERCRAFT MODEL	IMPELLER P/N	MATERIAL	PITCH
3D RFI	271 001 496	Stainless steel	Progressive pitch 11° - 20°

DRIVE SYSTEM

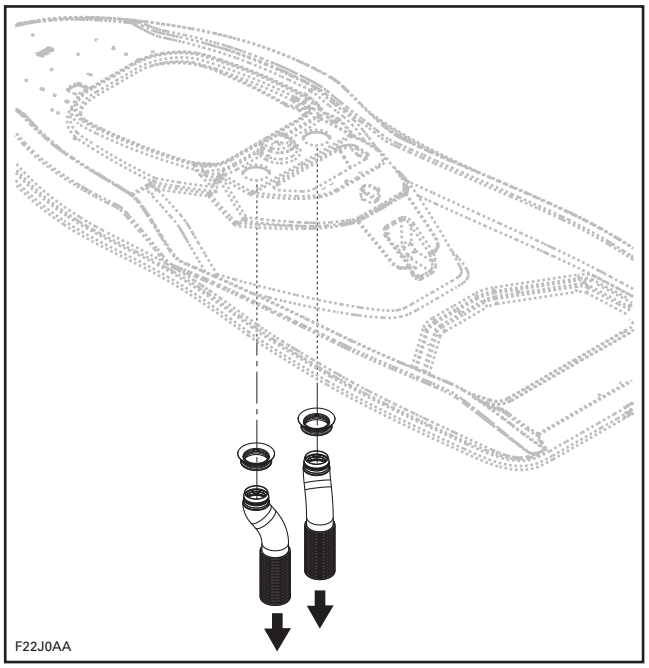


REMOVAL

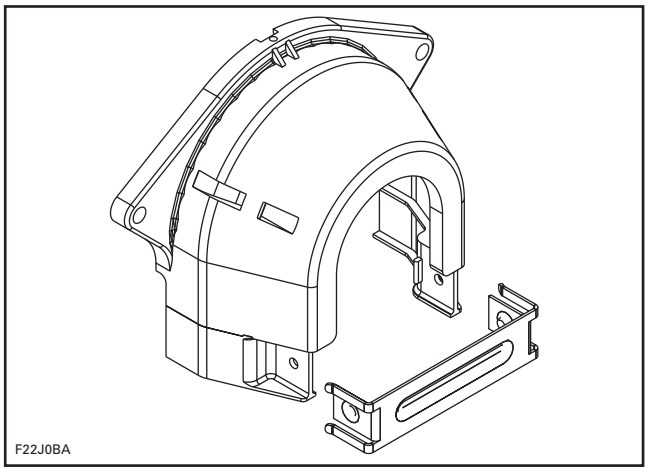
PTO Flywheel Guard

Lift and lock steering pole, remove hood and remove storage tray.

Pull down vent tubes from body.


F22J0AA

Detach link plate at the back of flywheel guard then remove guard.

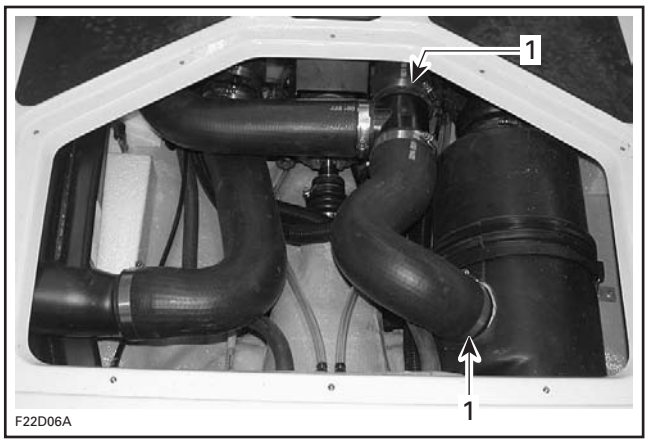

F22J0BA

Rear Drive Shaft

Remove rear access panel.

Remove clamps from exhaust hoses where shown.

Pull out T-fitting with hoses and resonator.

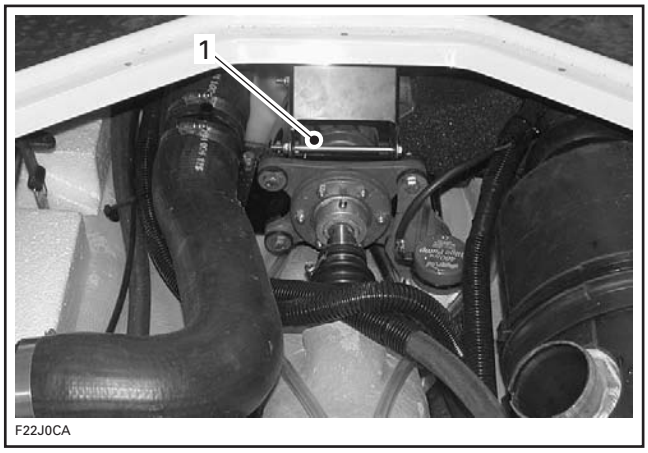


F22D06A

1. Disconnect those clamps

Move remaining hose away to make room.

Pull rear drive shaft until coupler is disengaged from splines.



F22J0CA

1. Pull drive shaft to disengage coupler from splines

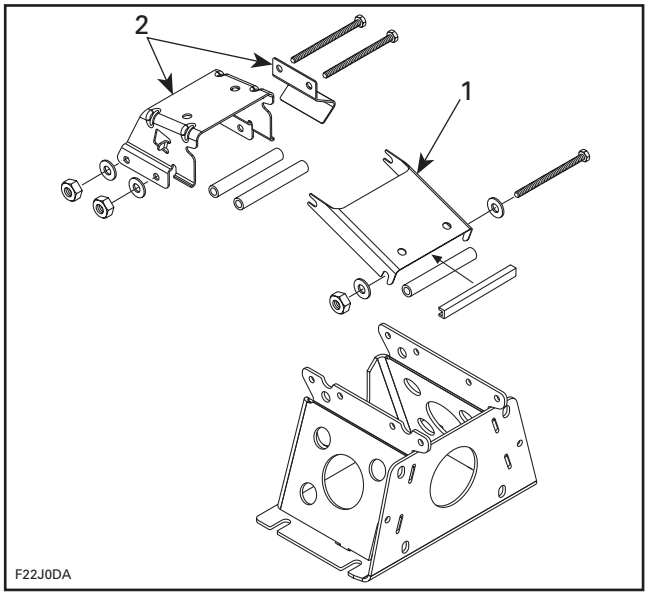
Remove rear drive shaft.

Remove coupler.

Front Drive Shaft

Remove top foam and protective plate, bracket then side foam.

NOTE: For detailed instructions pertaining to side foam removal, refer to EXHAUST SYSTEM.

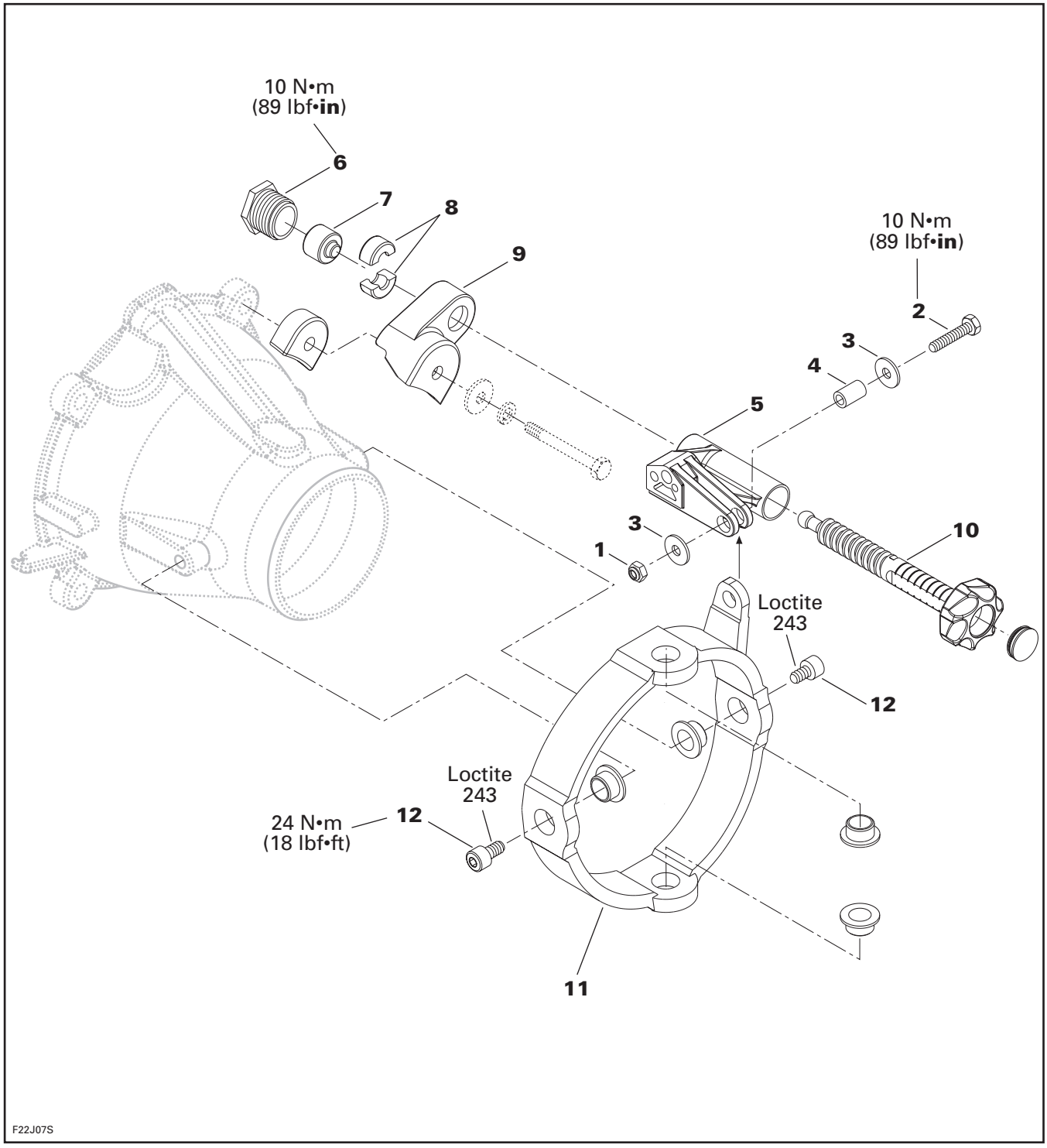


1. Protective plate
2. Bracket

Remove front drive shaft.

VARIABLE TRIM SYSTEM

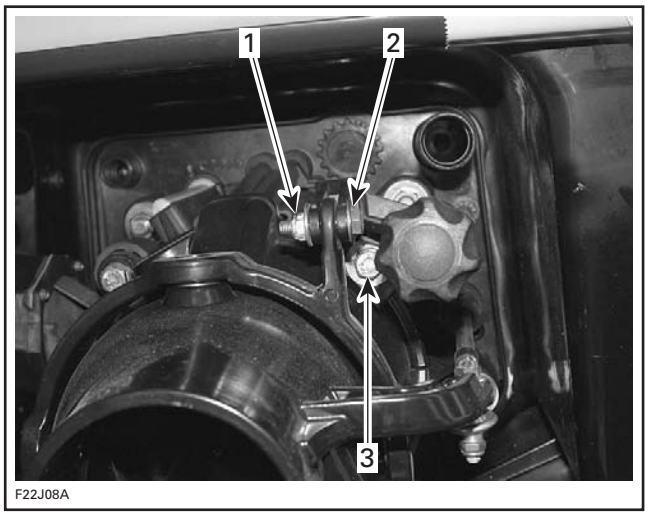
3D RFI



REMOVAL

Remove nut **no. 1**, bolt **no. 2**, flat washers **no. 3**, and bushing **no. 4**.

Remove venturi screw.



1. Nut
2. Bolt
3. Venturi screw

To remove trim ring/nozzle **no. 11**, loosen screws **no. 12**.

DISASSEMBLY

Loosen nut **no. 6** from support **no. 9**.

Remove rubber spacer **no. 7** and half bushings **no. 8**.

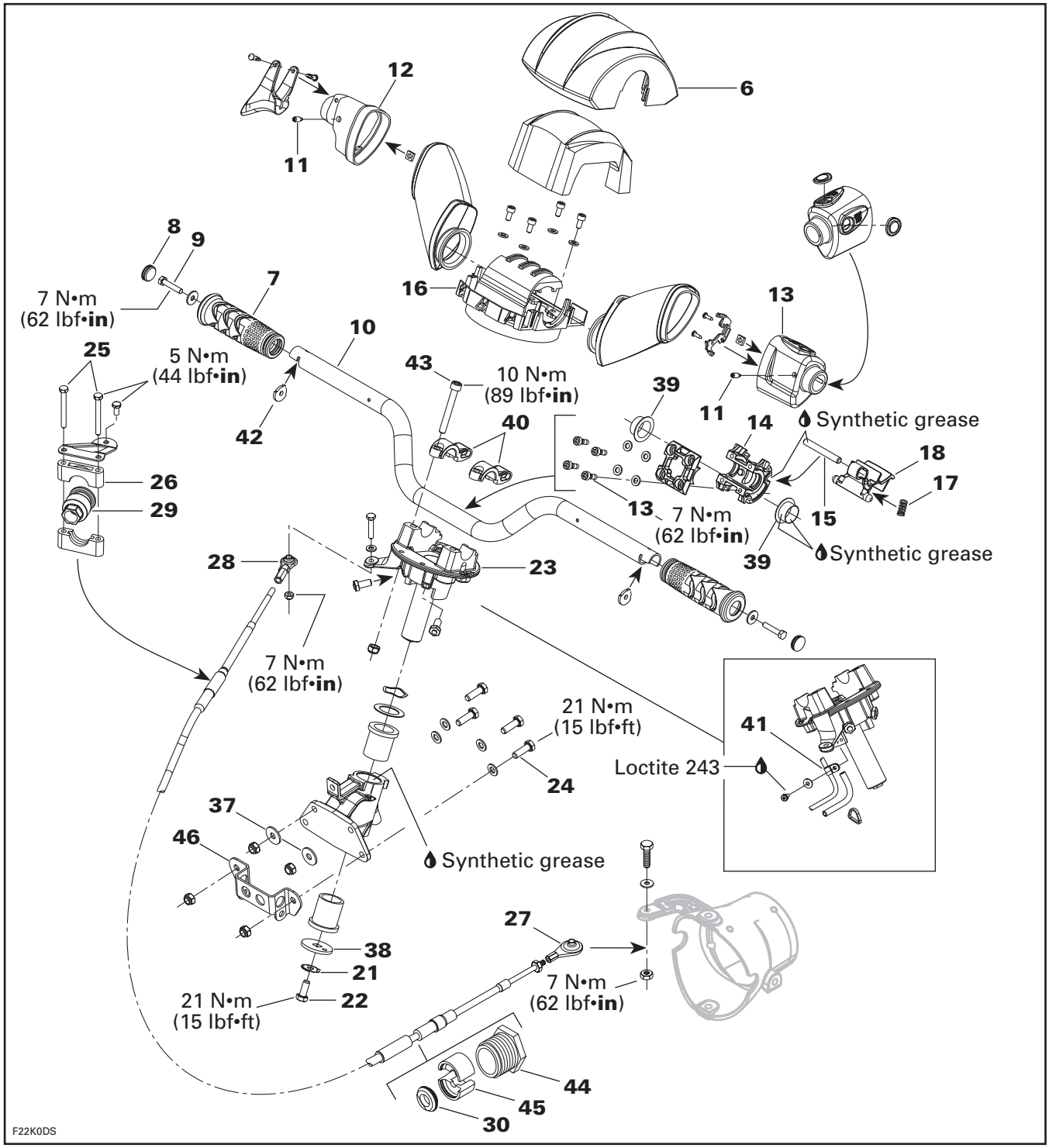
Unscrew adjustment knob **no. 10** from pivot **no. 5**.

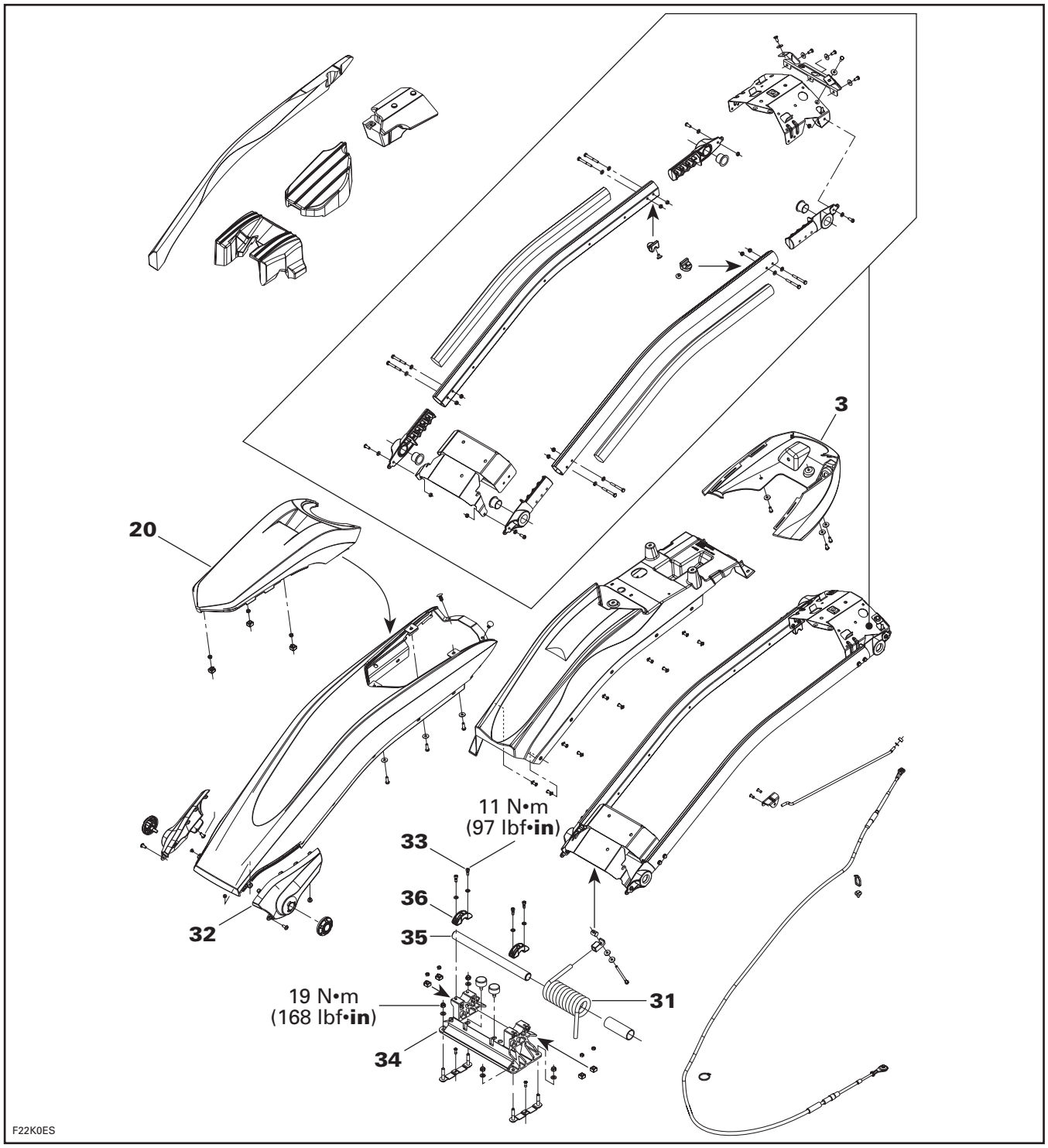
ASSEMBLY

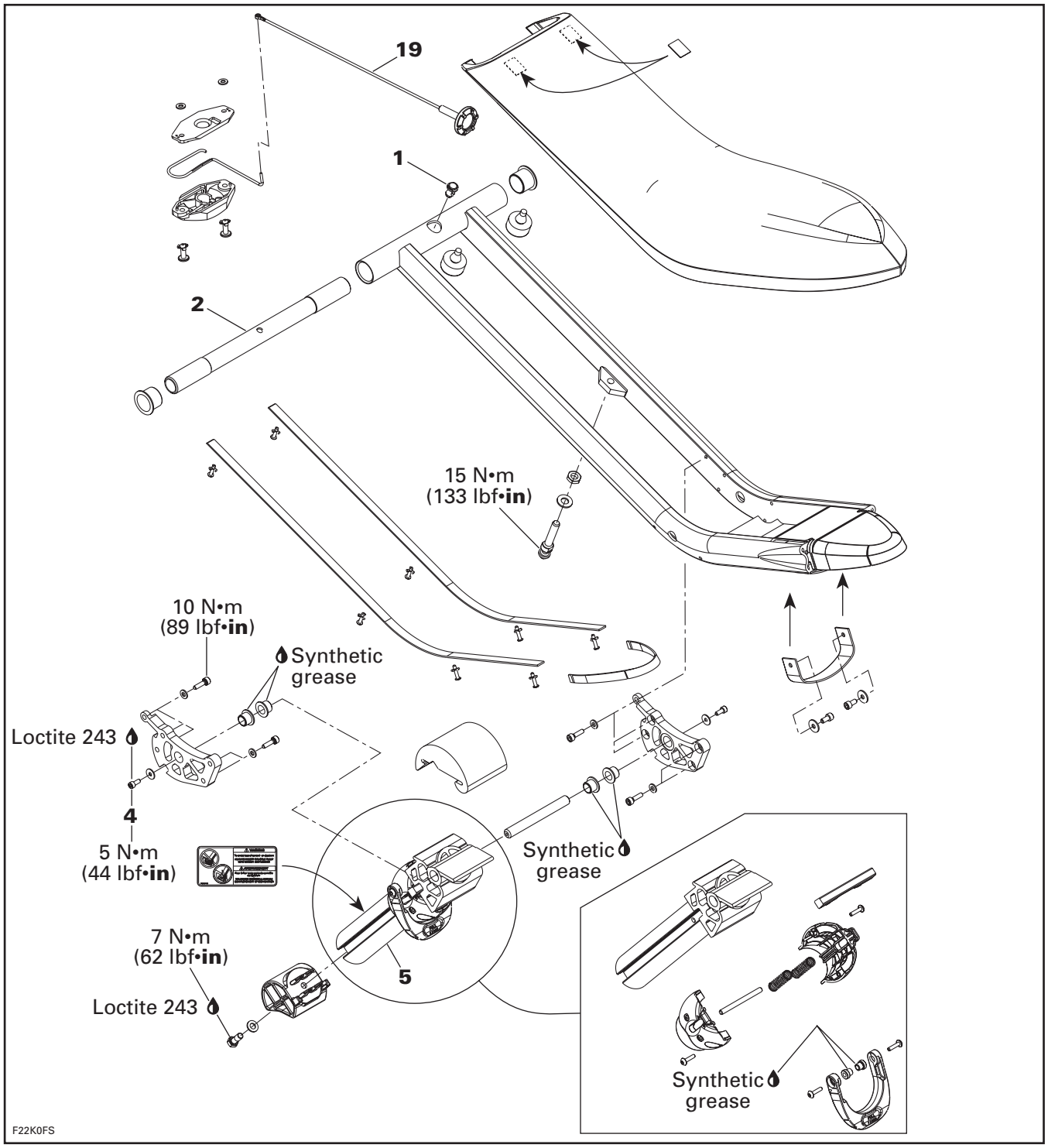
Assembly is essentially the reverse of disassembly procedures. Refer to the main illustration at the beginning of this sub-section for proper torque specifications and service products to be used.

STEERING SYSTEM

3D RFI




3
20
11 N•m
(97 lbf•in)
33
36
35
32
31
19 N•m
(168 lbf•in)
34
F22K0ES


19
1
2
15 N•m
(133 lbf•in)
10 N•m
(89 lbf•in)
Synthetic
grease
Loctite 243
4
5 N•m
(44 lbf•in)
Synthetic
grease
7 N•m
(62 lbf•in)
5
Loctite 243
Synthetic
grease
F22K0FS

INSPECTION

NOTE: A mechanism that is hard to move might only need to be disassembled, cleaned, lubricated then reinstalled.

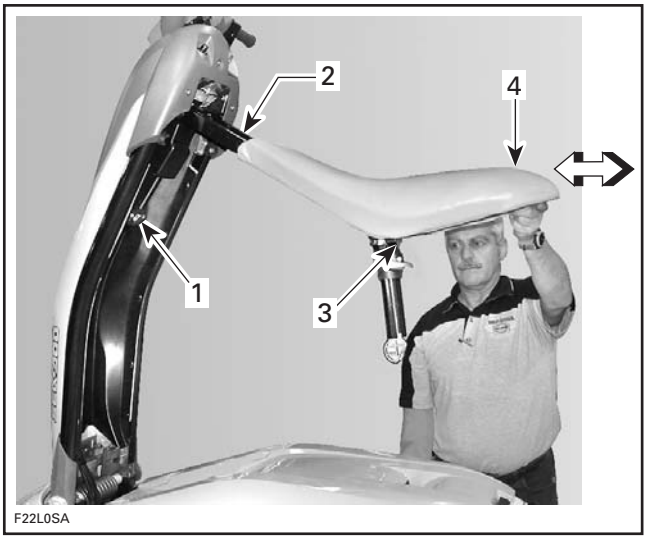
If there is excessive play in the following inspections, replace worn bushings or any other worn component.

Moto Seat

Check that the moto seat properly latches into the steering pole. Inspect the latch mechanism for wear.

Deploy the seat. Ensure that the seat moves freely while rotating. Check for excessive lateral play.

Also check for excessive play of seat post in seat.



1. *Latch mechanism*
2. *Seat structure*
3. *Check play of seat post*
4. *Check lateral play of seat structure*

Inspect the seat post receiver in the deck. Check for dirt, sand or other debris. Check for excessive wear. Ensure that the cover moves freely.

Inspect post knuckle condition. Check for wear, cracks and tightness.

Install the seat post in its receiver and ensure it latches properly. Inspect latch mechanism for wear. Try pulling out the post without releasing the latch.

Handlebar and Adjuster

Move handlebar to each position. It should move easily and lock in each position. Make sure there is no excessive play in the handlebar and in the steering stem.

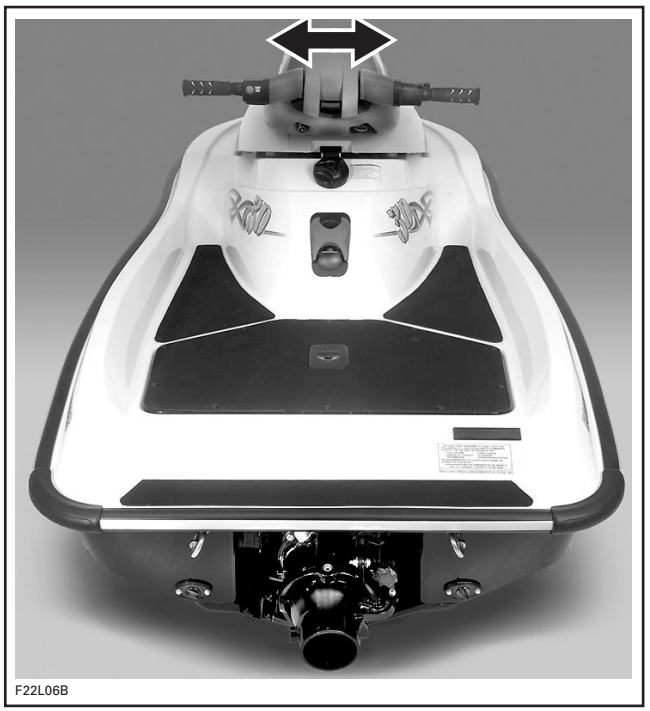
Steering Pole

First make sure to stow the moto seat.

Move steering pole up and down. It should move freely and smoothly without resistance. If steering pole feels too heavy, it can be adjusted with the return spring. If it does not help, the spring **no. 31** could be broken.

1. *Steering pole*

Lower steering pole to the lowest position and try moving it from side to side to detect any excessive play.

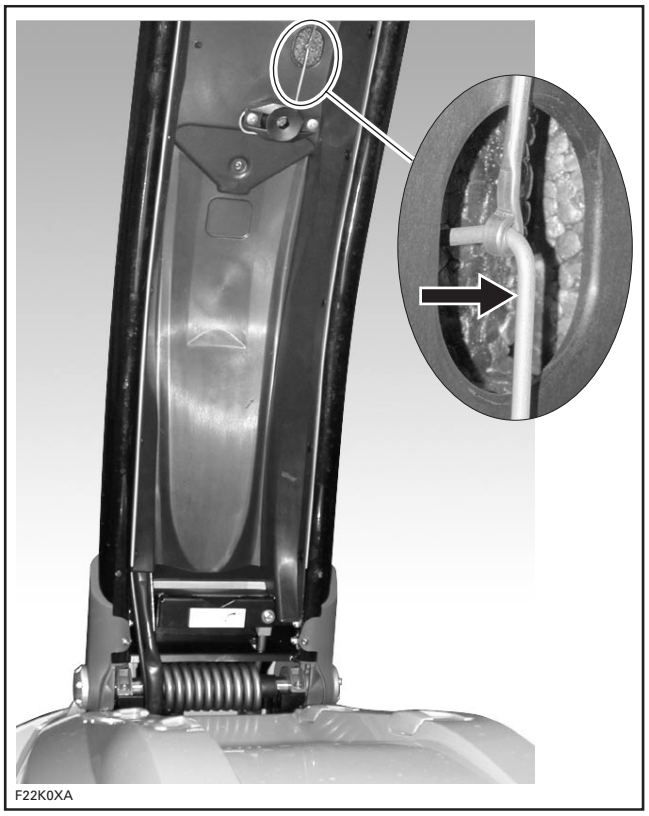


DISASSEMBLY

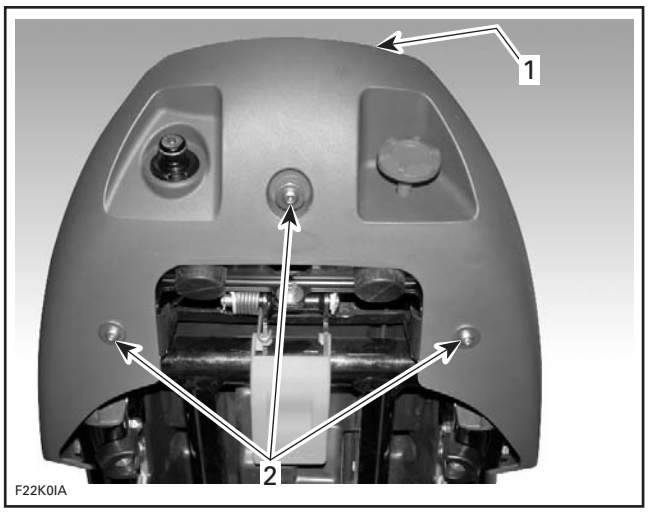
Moto Seat

Deploy moto seat.

Disconnect latch rod **no. 19**.


F22K0XA

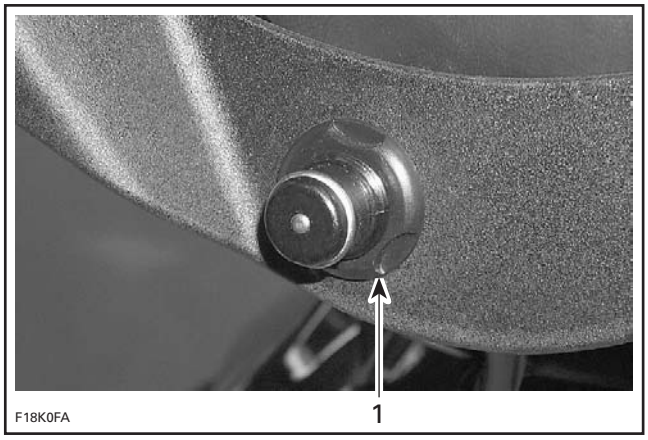
Remove screws of lower cover **no. 3** then slide cover rearward.



F22K0IA

1. Lower cover
2. Remove screws

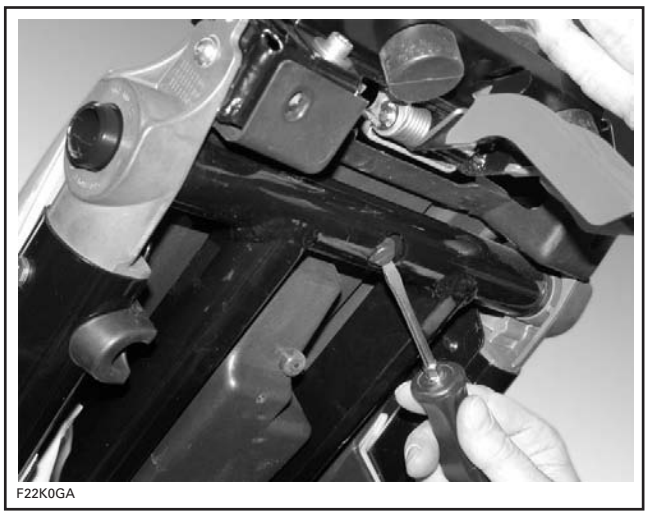
Unscrew DESS switch nut using safety lanyard switch tool (P/N 529 034 600).



F18K0FA

TYPICAL
1. DESS switch nut

Pull plastic rivet **no. 1** out.


F22K0GA

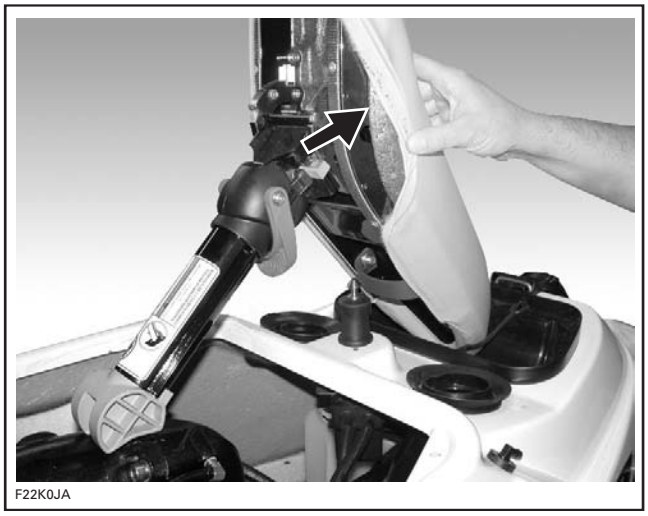
Position seat post in the receiver.

Using a plastic hammer, push moto seat axle **no. 2** out while holding seat.

F22K0HA

Post

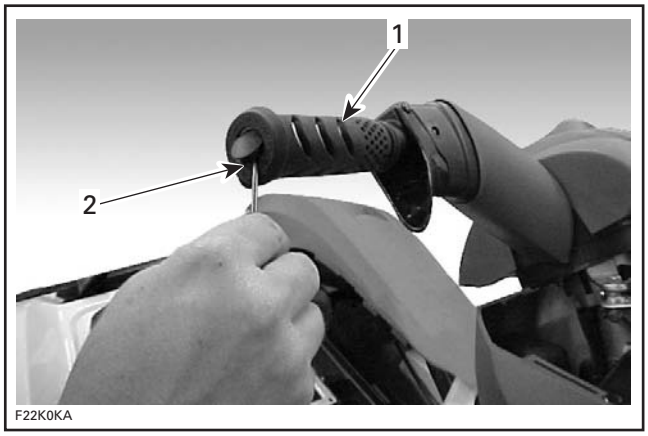
Partially peel seat cover to expose screw **no. 4**.


F22K0JA

Remove screw and pull out post **no. 5**.

Handle Grip and Grip Insert

To remove handle grip **no. 7**, pull out cap **no. 8** and remove screw **no. 9**.



F22K0KA

1. Handle grip
2. Remove cap and screw

Pull out grip and remove grip insert from handlebar **no. 10**.

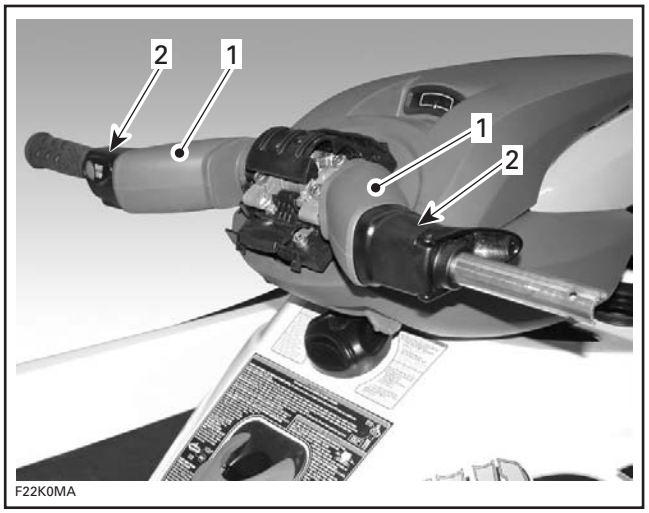
NOTE: Verify grip insert for damage.

Steering Cover

Pull up steering padding **no. 6**.

F22K0LA

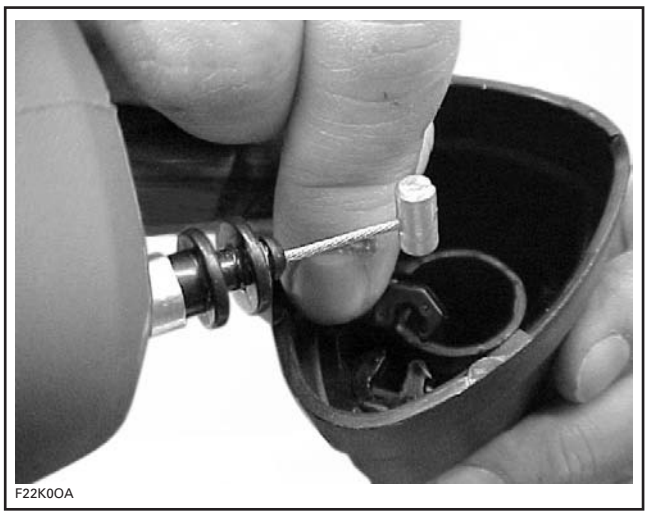
Loosen set screws **no. 11** of handlebar housings **no. 12** and **no. 13**.



1. Cover
2. Screw

RH Cover

Unhook throttle cable.



Pull out throttle housing **no. 12**.

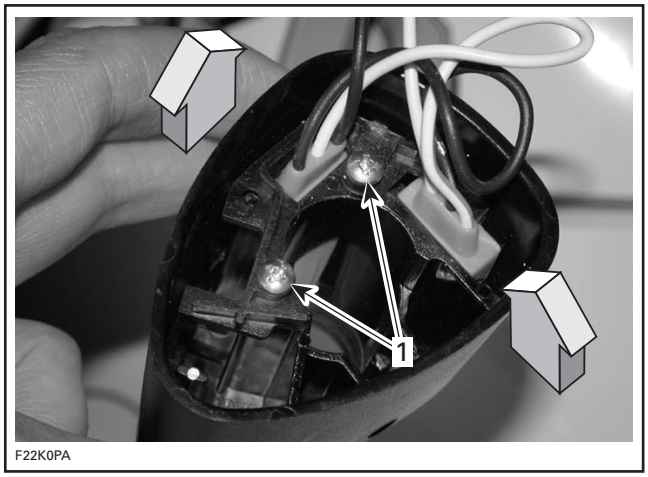
Remove cover.

LH Cover

Pull out start/stop switch housing **no. 13**.

Remove switches from housing.

Remove cover.

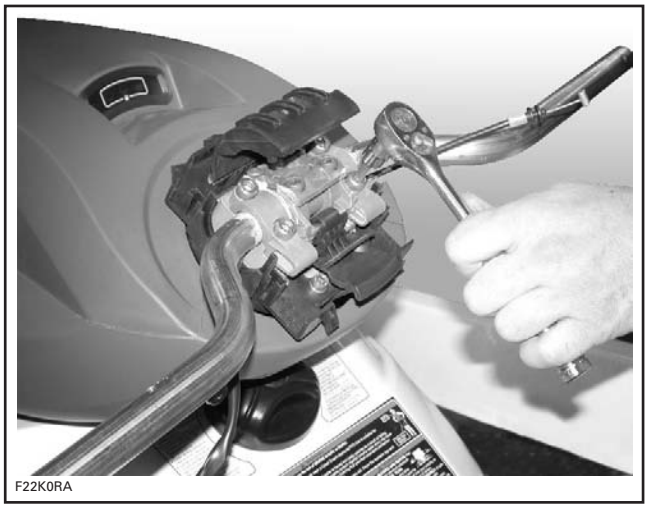


1. Retaining screws

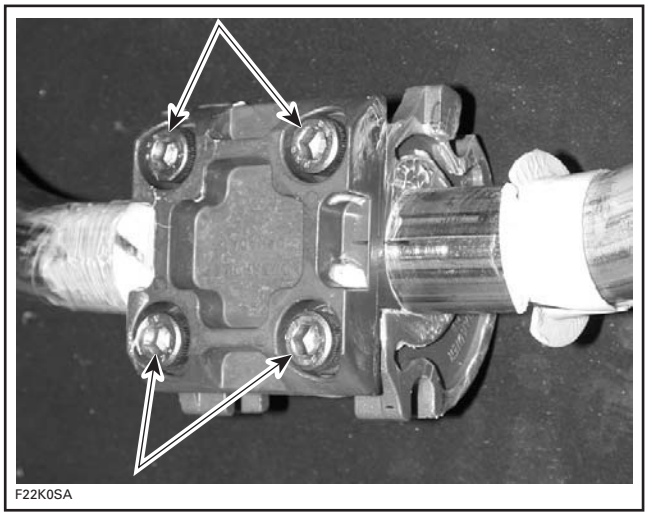
Handlebar and Adjuster

Lift adjuster cover.

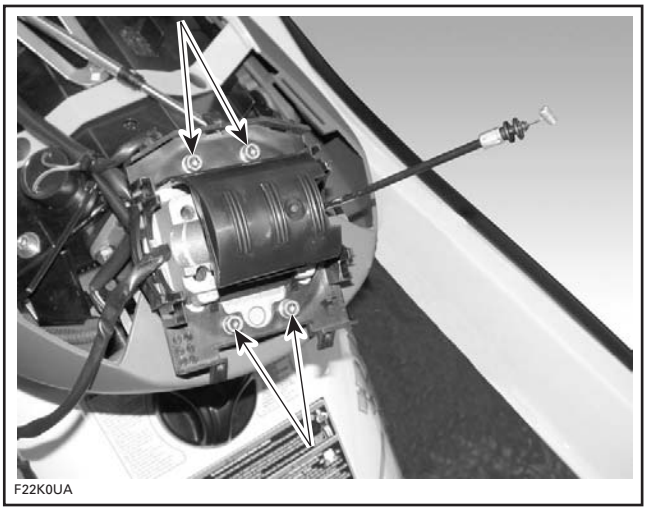
Remove screws **no. 43** and remove handlebar **no. 10**.


F22K0RA

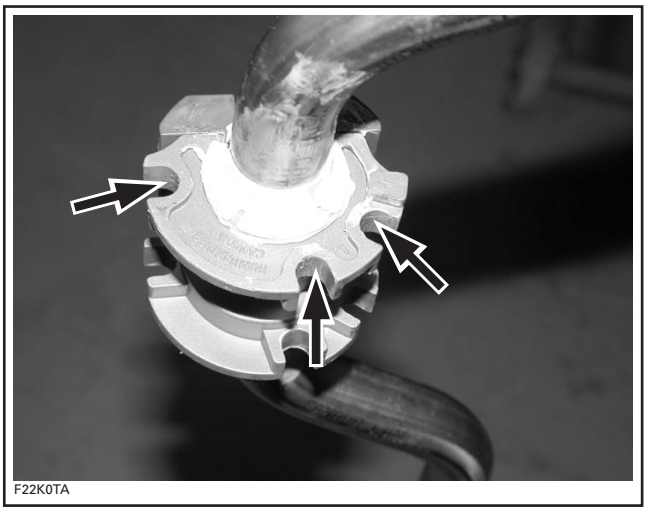
Remove screws **no. 13** of adjuster blocks.


F22K0SA

Remove spring **no. 17**, steering padding support **no. 16** then latch lever **no. 18**.

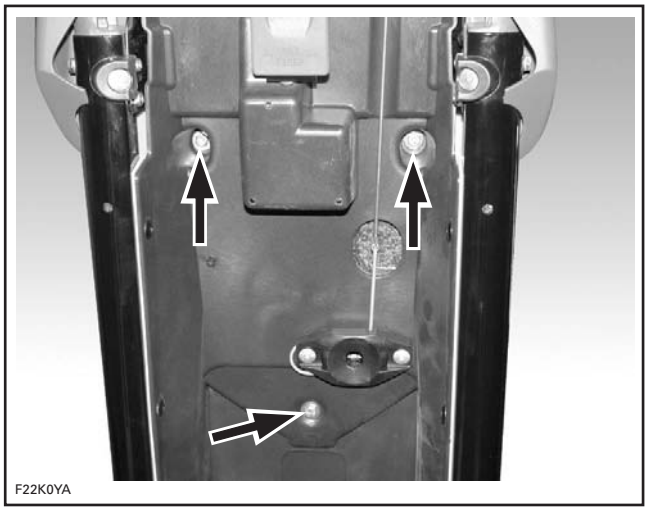

F22K0UA

Inspect notches of blocks **no. 14** and the pin **no. 15** for wear or other damage.


F22K0TA

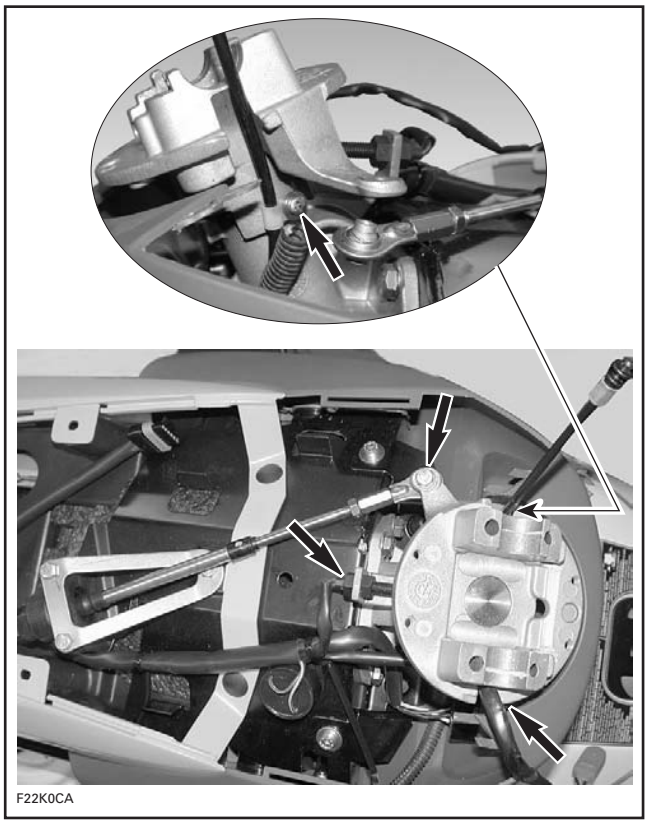
Steering Stem and Support

Remove top cover **no. 20**.


F22K0YA

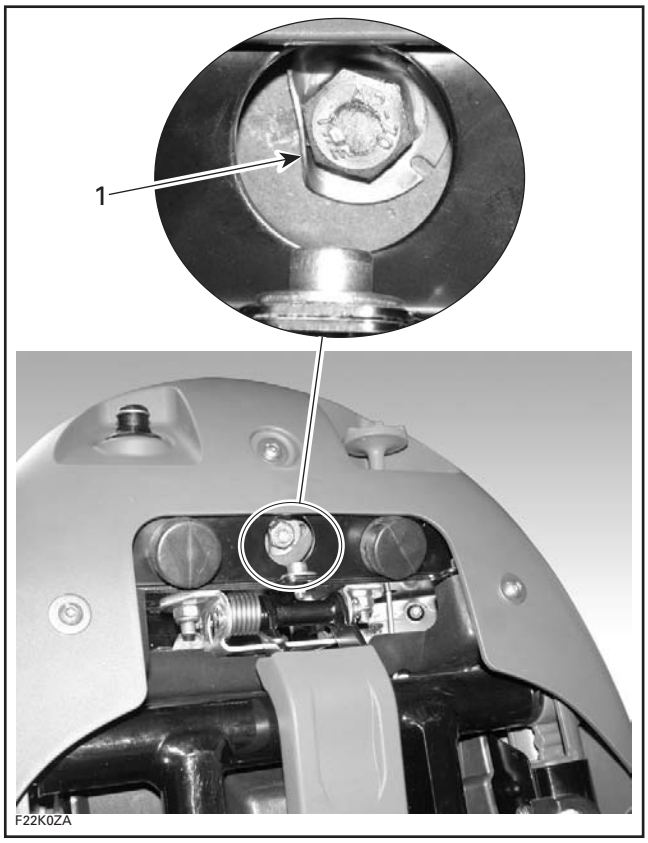
Detach steering cable, switch harness and throttle cable from steering support.

Remove OTAS switch.


F22K0CA

Raise steering pole.

Unbend lock tab **no. 21** then unscrew steering stem screw **no. 22**.

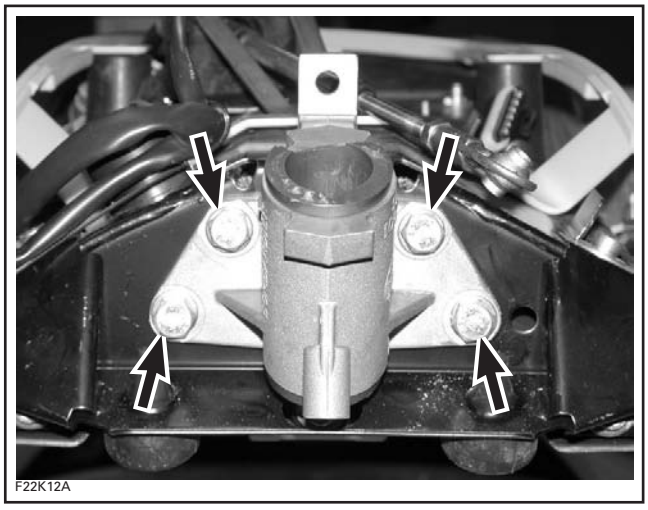


F22K0ZA

1. Unbend tab

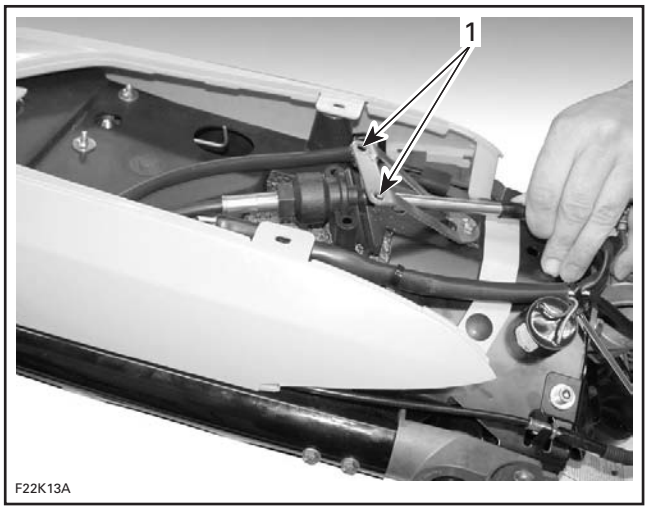
Pull steering stem **no. 23** out.

Remove steering support screws **no. 24**.


F22K12A

Steering Cable

Remove screws **no. 25**.



1. Srews removed

Remove retaining block **no. 26**.

Remove ball joint **no. 28** and adjustment knob **no. 29** from cable.

Disconnect ball joint **no. 27** from jet pump nozzle then from cable.

Use steering cable tool (P/N 295 000 145) and remove nut **no. 44**, then remove half rings **no. 45** and O-ring **no. 30**.

Raise steering pole.

Cut locking ties as required to allow puling out steering cable.

Remove steering pole to be able to pull steering cable out of bilge. See below.

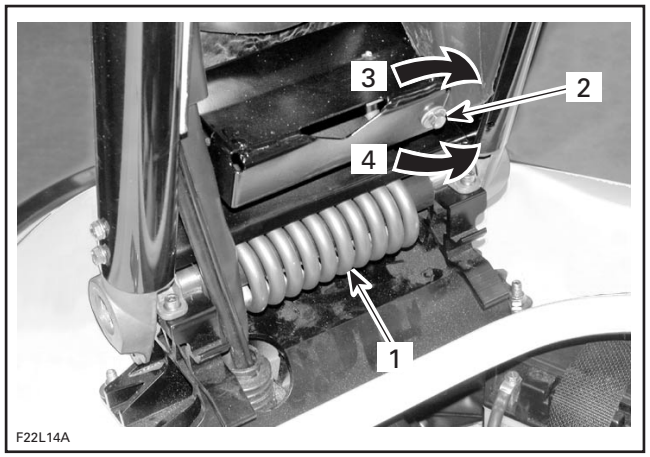
Steering Pole

Raise and lock steering pole with its retainer.

Cut locking ties as required then pull throttle cable out of steering pole.

Pull wiring harness out of pole.

Completely release spring **no. 31** preload.



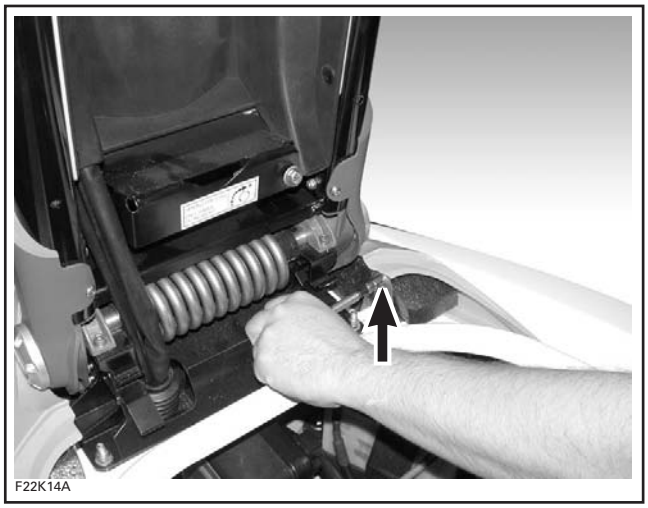
1. Return spring
2. Adjustment
3. To increase preload
4. To reduce preload

Lower steering pole.

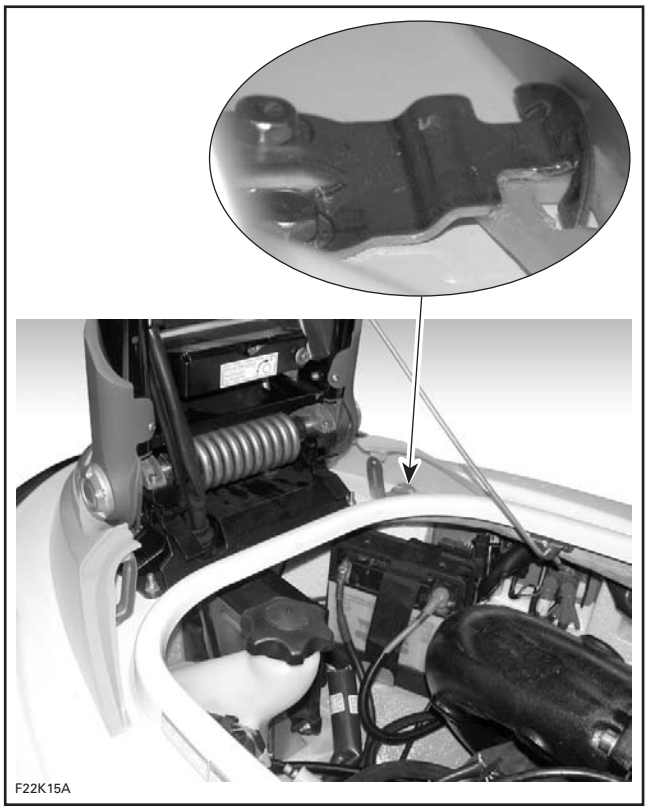
Remove front cover in the following step order.

CAUTION: Work carefully when releasing locking tabs from cover to avoid damaging cover.

Remove side screws.

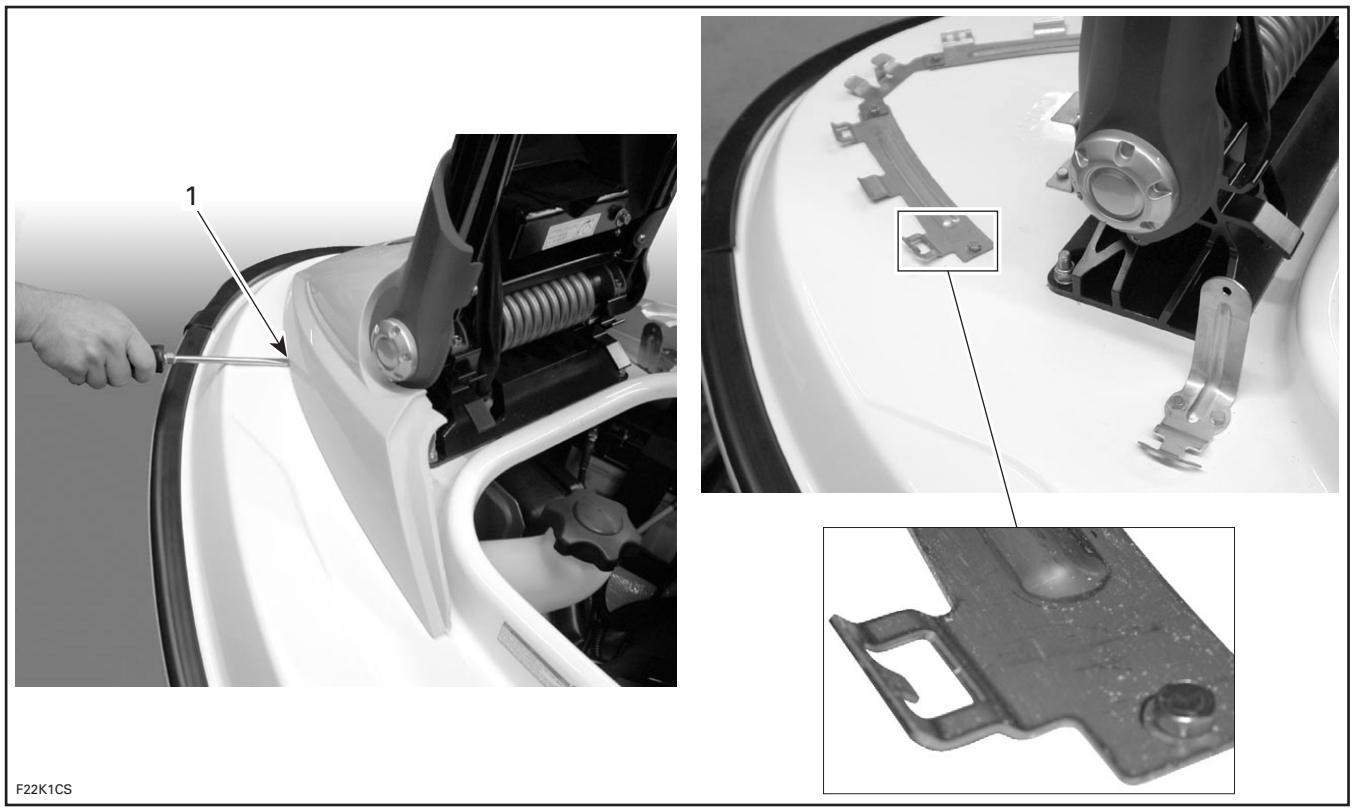


Release rear metal tabs.



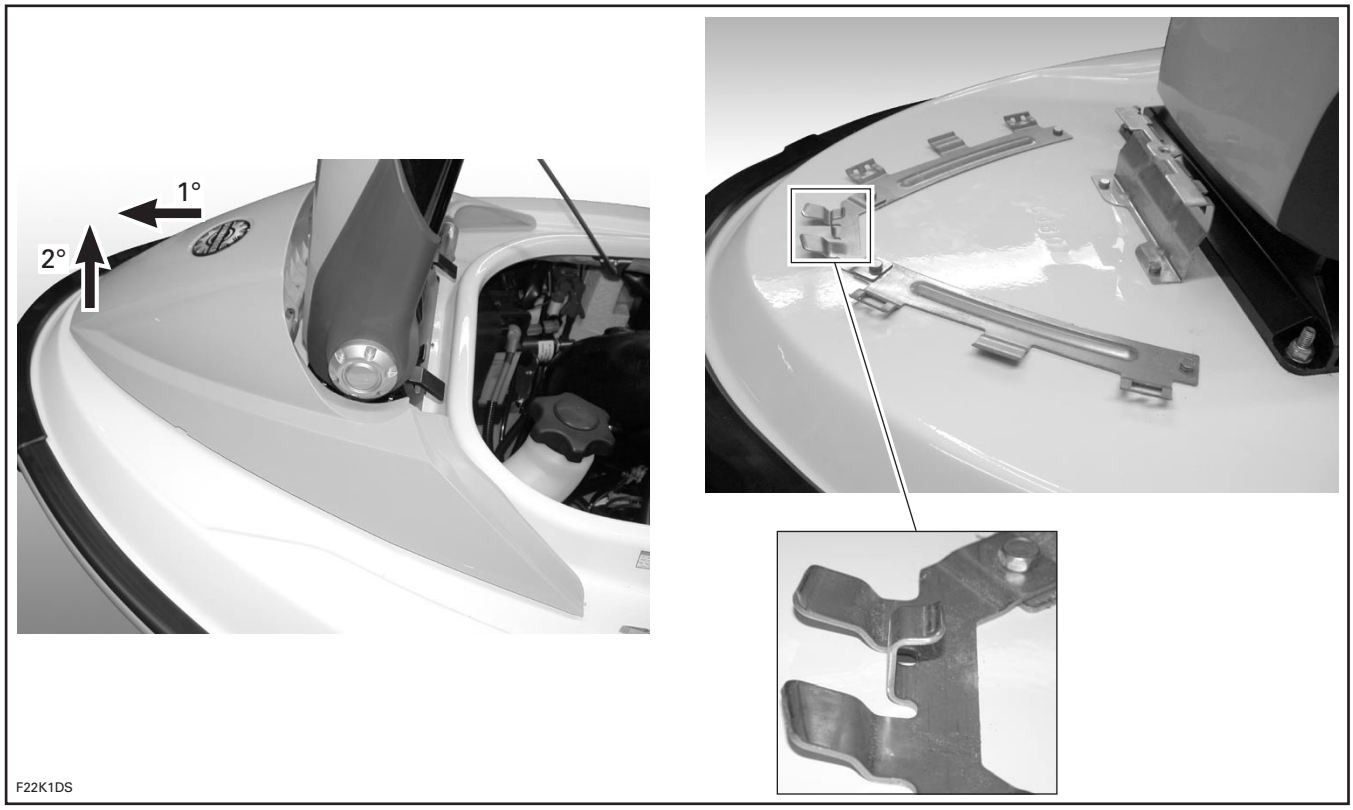
INNER FOAM REMOVED FOR CLARITY PURPOSE

Using the provided openings, release side metal tabs while pulling cover outward.

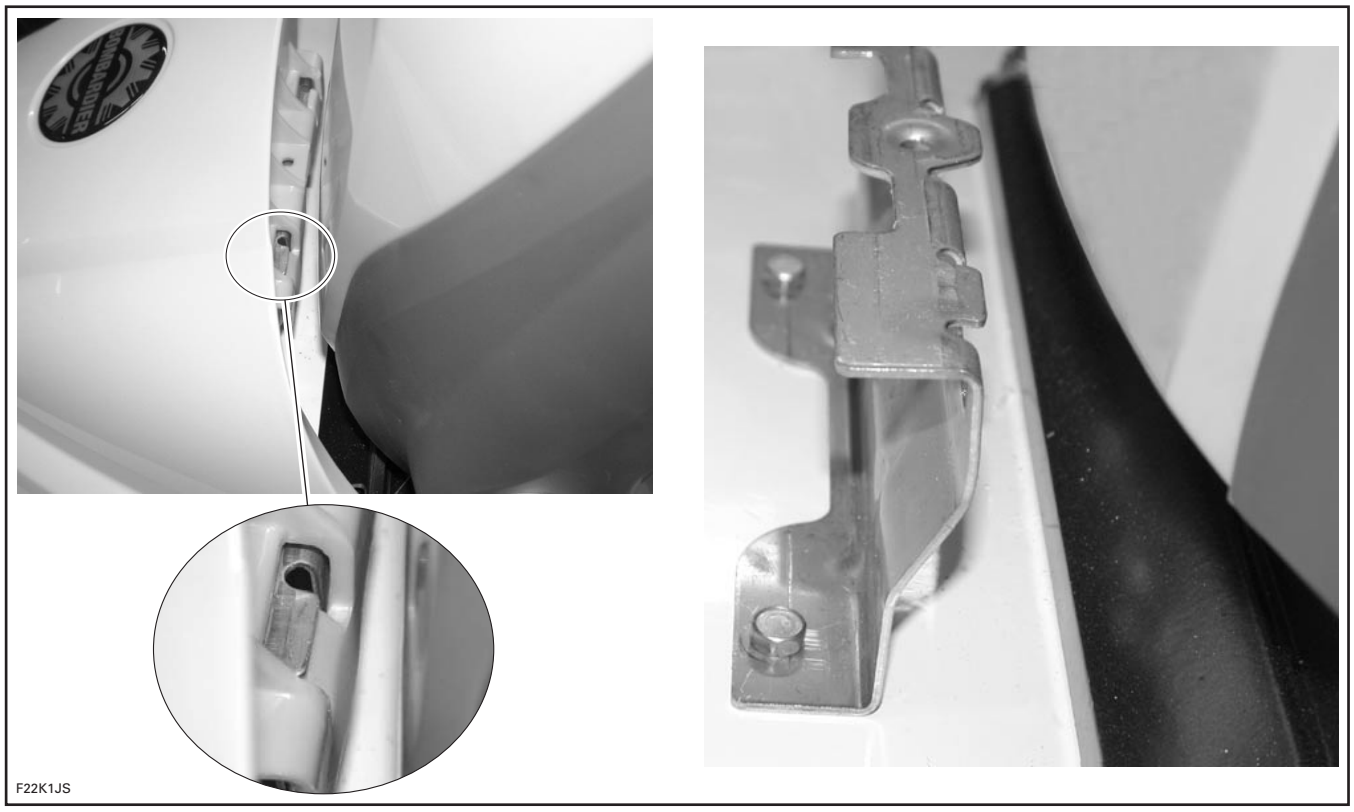


1. Side opening

Push cover forward then lift front part to unlock cover.



For the center rear locks, push plastic tabs rearward to release.


F22K1JS

Unscrew side and bottom screws then slide caps **no. 32** forward to remove.

F22K1OA

NOTE: It is suggested to hook-up steering pole to the ceiling to hold it while removing from vehicle and particularly while removing steering cable.

Remove end screws and clamp screws **no. 33**.

F22K1PA

Maintain steering pole vertically and pull steering cable out.

Remove steering pole from body.

Remove bridge mount **no. 34** from body.

ASSEMBLY

Assembly is essentially the reverse of disassembly procedures. However, pay particular attention to the following.

CAUTION: Apply all specified torques and service products as per main illustration at the beginning of this subsection.

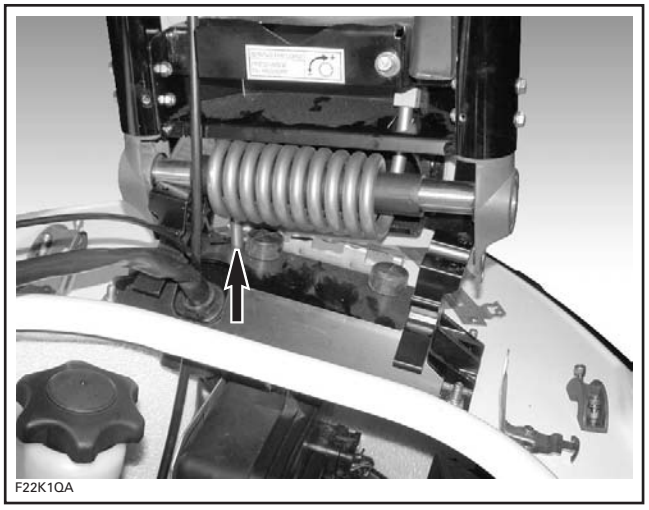
Steering Pole

NOTE: It is suggested to hook-up steering pole to the ceiling to hold it while installing to vehicle and particularly while installing steering cable.

Route steering cable toward jet pump making sure to route along bilge.

Maintain steering pole vertically while inserting steering cable in pole.

Insert spring end into bridge mount hole.


F22K1QA

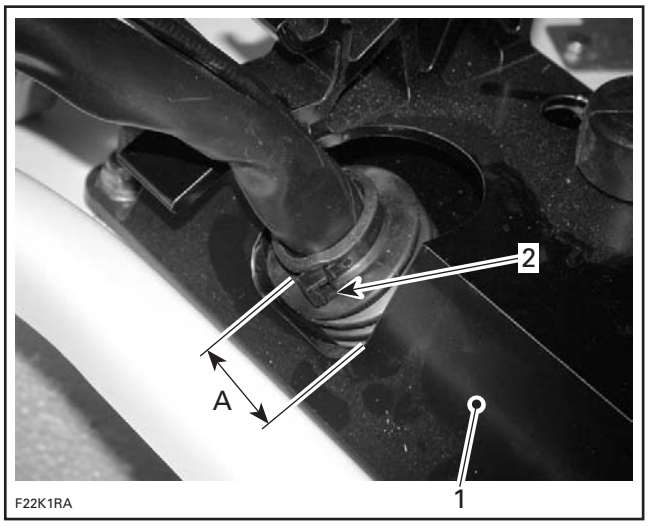
Secure pole to bridge mount. Torque nuts in a criss-cross sequence.

Ensure to center pivot tube **no. 35** with clamps **no. 36**.

Insert wiring harness and throttle cable in pole.

Ensure to stretch boot in the bridge mount **no. 34** to the indicated length. Then install a locking tie and strongly tighten.

NOTE: Ensure steering pole is centered (reference fuel tank cap).



F22K1RA

1. Bridge mount
2. Tightened locking tie
A. 45 mm (1.77 in)

NOTE: A missing or unfastened locking tie would allow water entry in bilge.

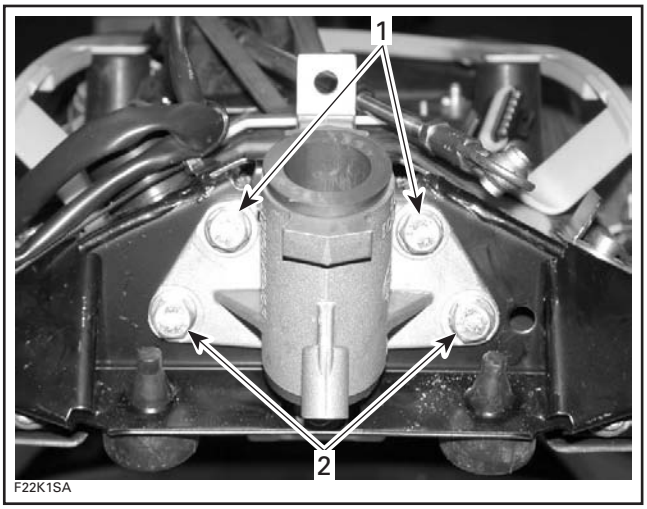
Steering Stem and Support

Position steering support **no. 23** onto steering pole.

Lubricate moving parts and bushings.

Position washers **no. 37** against top nuts.

Install steering pole retainer **no. 46** on bottom screws.

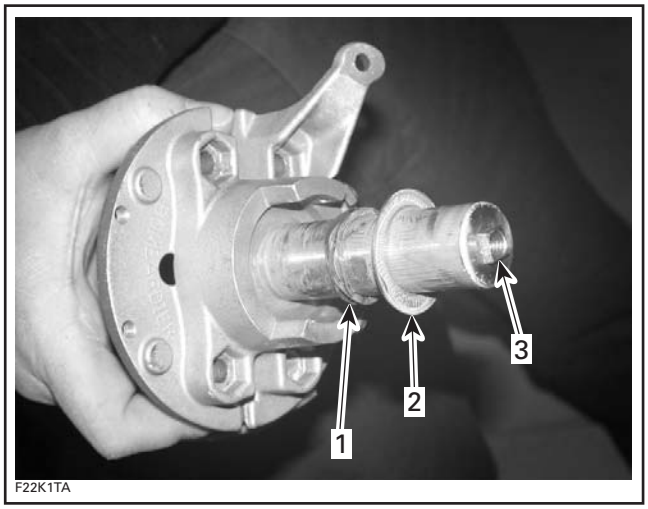


F22K1SA

1. Washers against nuts here
2. Steering pole retainer against nuts here

Torque screws **no. 24** of steering support in a criss-cross sequence.

Ensure spring washer and washer are positioned as shown.



1. Spring washers
2. Washer
3. Notice the square end

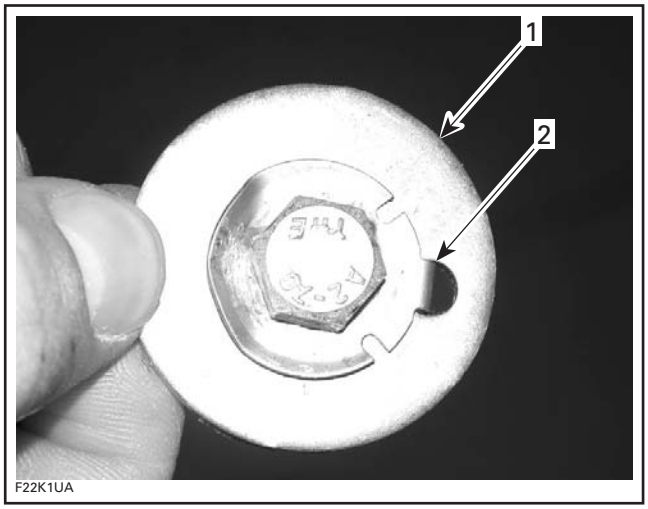
Install steering stem into steering support and position its lever on the RH side.

Position rounded edge of washer **no. 38** opposite of screw head and position washer square hole into square end of stem.

Using a new tab lock **no. 21** position its small tab into hole of washer **no. 38**.

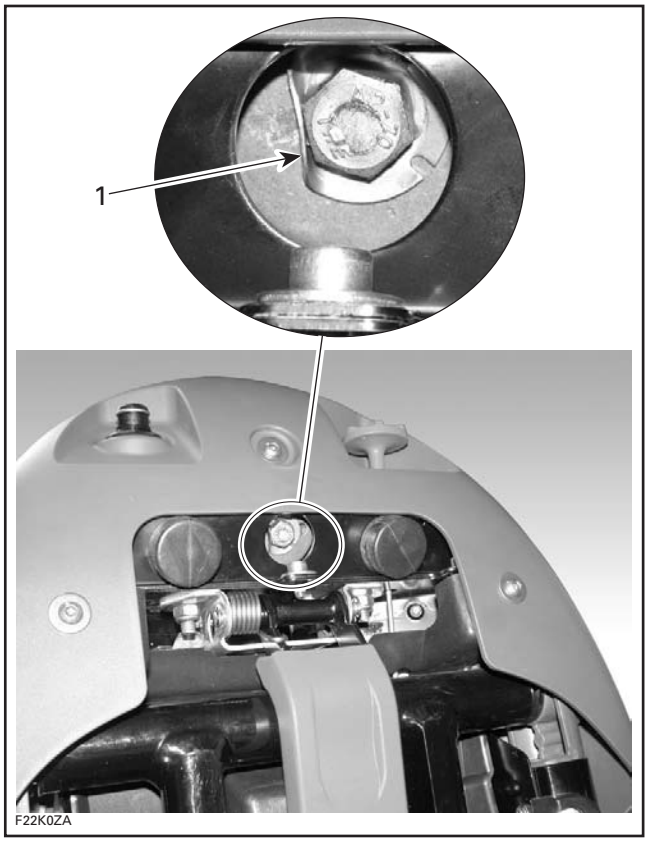
⚠ WARNING

Ensure to use a new tab lock.



1. Rounded edge on backside
2. Small tab into hole of washer

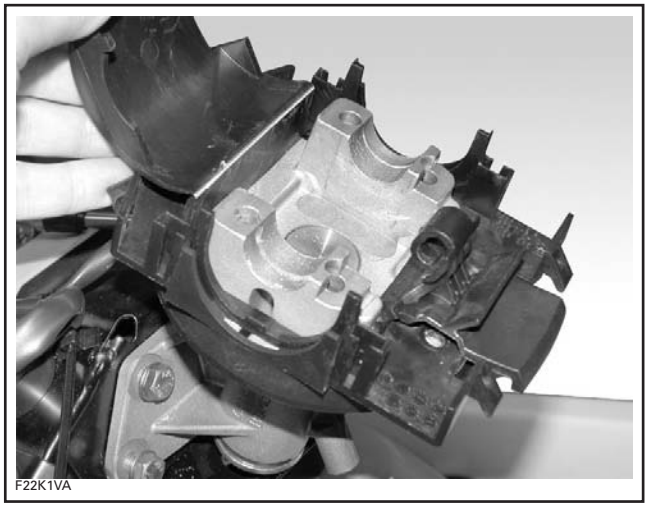
Torque screw **no. 22** then bend tab lock edge against a flat side of screw head.

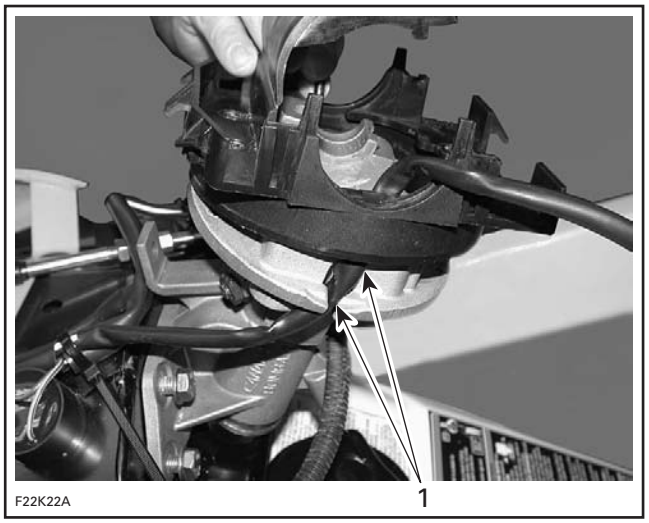


1. Tab lock edge against flat side of screw head

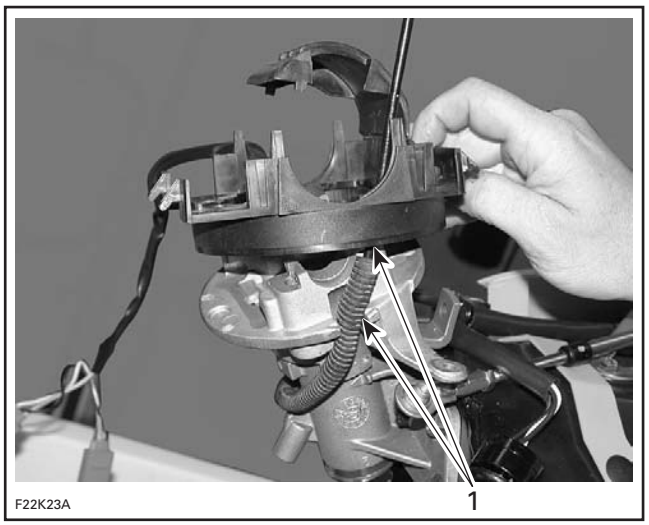
Properly route wiring harness and steering cable in steering support notches.

First install latch lever **no. 18** then steering padding support **no. 16**.



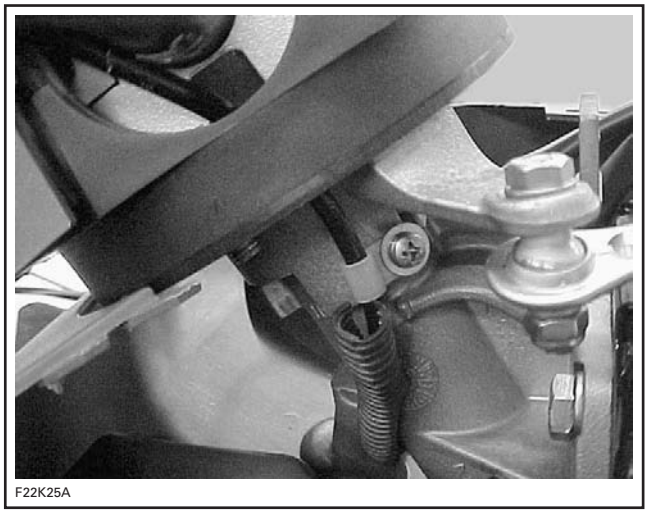


1. Wiring harness routing



1. Throttle cable routing

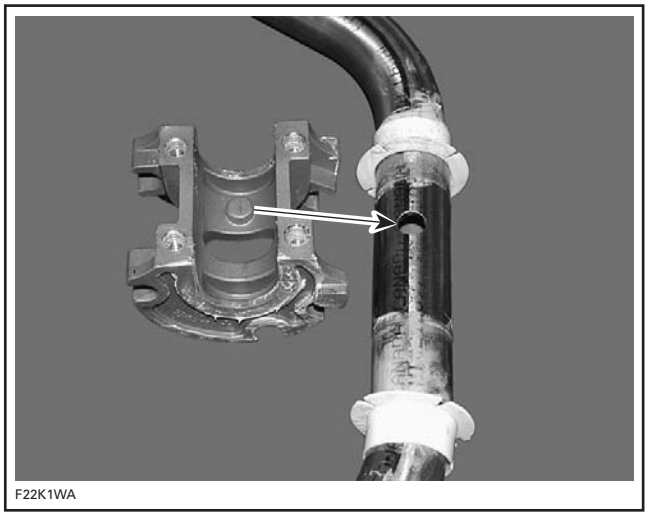
Secure throttle cable to steering support with clamp **no. 41**.



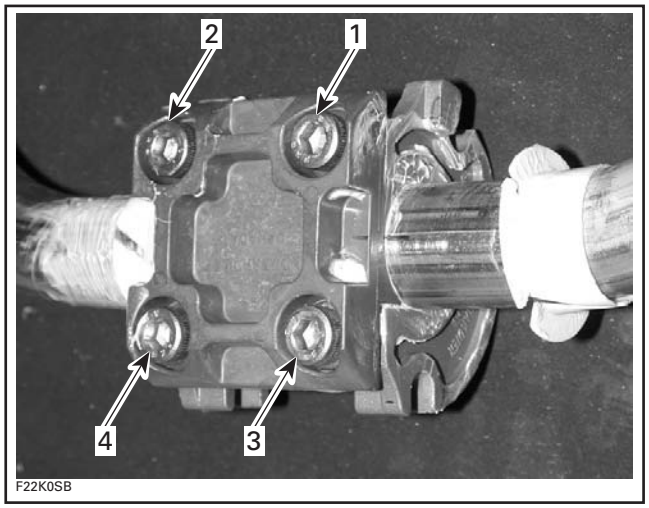
Handlebar and Adjuster

When installing blocks **no. 14** on handlebar, ensure to position block pin into handlebar hole.

NOTE: Block must be centered on handlebar. If not, it is in reverse position.



Torque screws **no. 13** as per the following sequence.

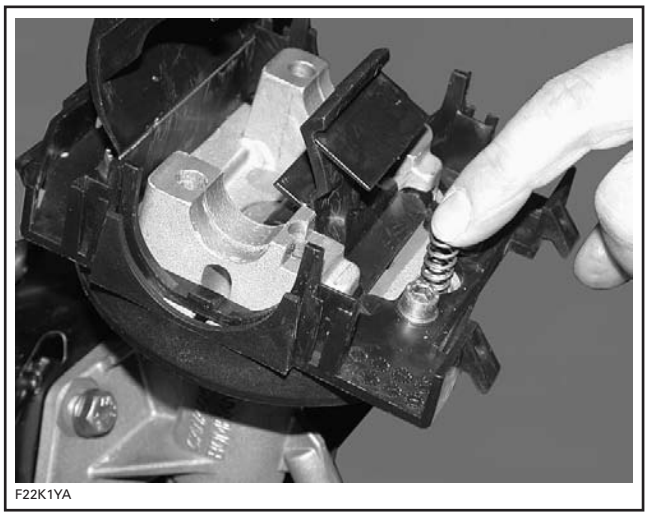


F22K0SB

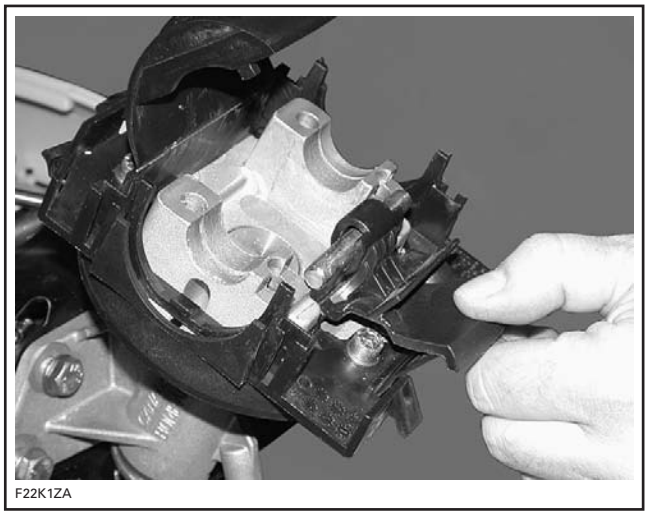
TORQUE SEQUENCE

Lubricate friction areas and bushings **no. 39** then slide bushings against blocks **no. 14**.

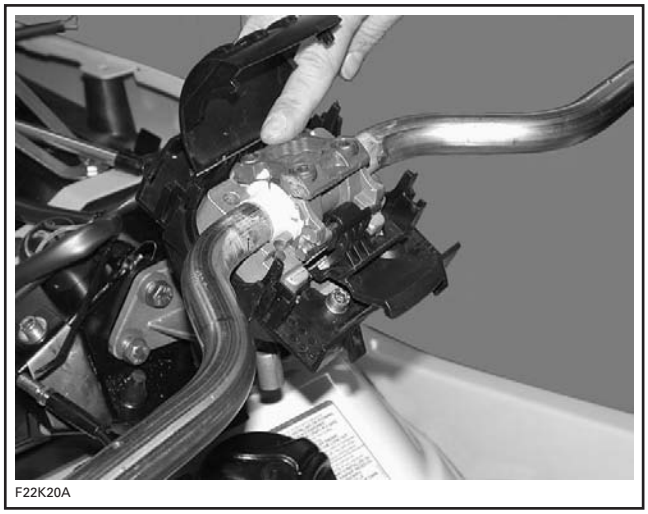
Compress spring **no. 7**.


F22K1YA

Install pin **no. 15**. Hold latch lever depressed.


F22K1ZA

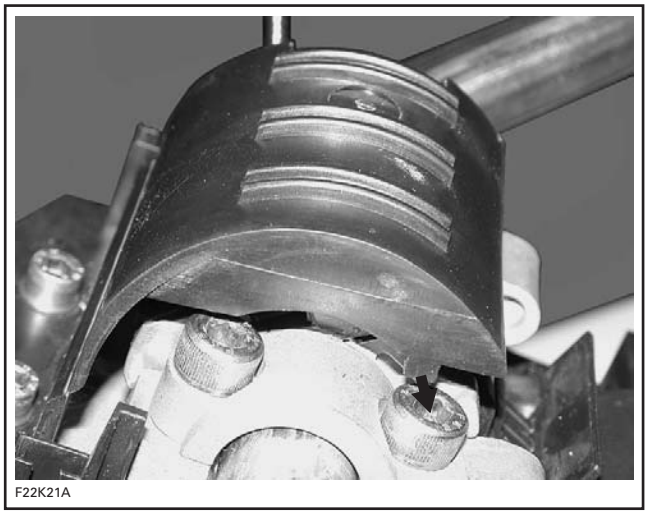
Install handlebar on steering support then upper clamps **no. 40**. Position pin **no. 15** into slots of blocks **no. 14**.


F22K20A

Lubricate pin **no. 15** and the notches on blocks **no. 14**.

Position handlebar vertically then torque screws **no. 43** in a criss-cross sequence.

Snap cover of steering padding support **no. 16** on screw heads.


F22K21A

Ensure handlebar adjuster works adequately.

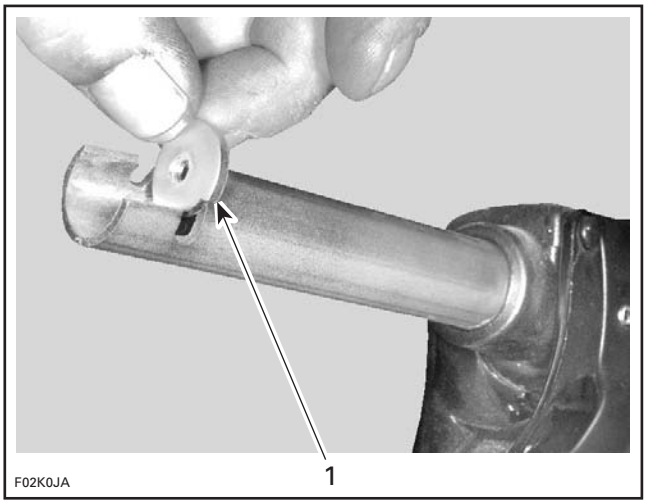
Secure steering cable ball joint **no. 28** to stem arm lever.

CAUTION: Ensure the ball joint is parallel to the stem arm within ±10°.

Properly install remaining components.

Handle Grip and Grip Insert

When installing the grip insert **no. 42** in the handlebar **no. 10**, ensure that it is properly inserted in the slot at the end of the handlebar tubing.



F02K0JA

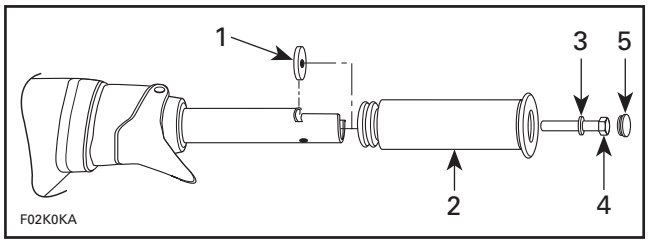
TYPICAL
1. Grip insert

Install grip **no. 7** on handlebar **no. 10** matching it to the notch in the handlebar.

Install flat washer and screw **no. 9**.

Torque screw to 7 N•m (62 lbf•**in**).

Install cap **no. 8**.



F02K0KA

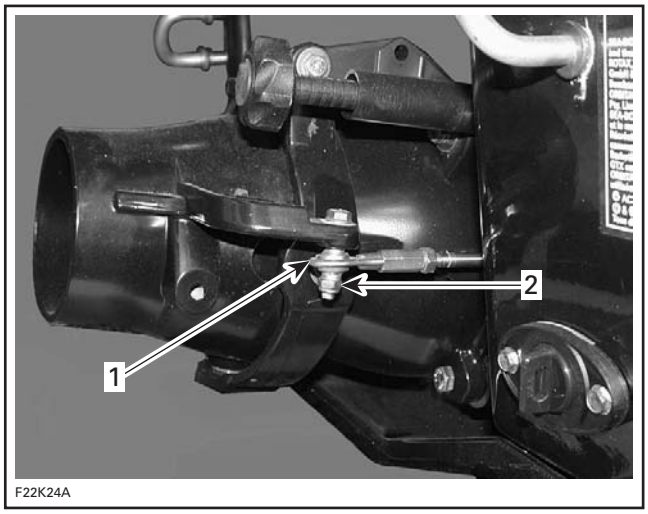
TYPICAL
1. Grip insert
2. Grip
3. Flat washer
*4. Screw. Torque to 7 N•m (62 lbf•**in**)*
5. Cap

CAUTION: Ensure to install flat washer otherwise screw will damage grip end.

Ball Joint

Secure the steering cable ball joint **no. 27** to the nozzle as per following illustration.

CAUTION: Ensure the ball joint is parallel to the nozzle arm within ±10°.



F22K24A

1. Ball joint below steering arm
*2. Torque nut to 7 N•m (62 lbf•**in**)*

Finalizing the Assembly

Install remaining components.

Ensure steering works adequately.

Ensure throttle cable works adequately in all handlebar adjustment position and in all steering pole position.

Perform throttle cable adjustment. Refer to ENGINE MANAGEMENT.

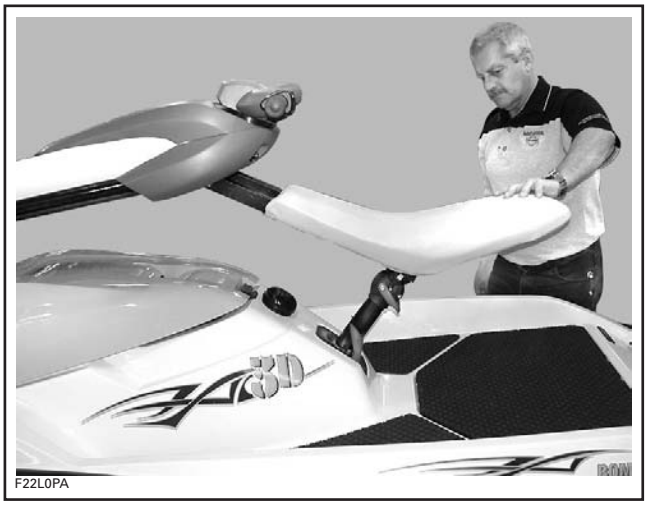
Ensure moto seat works and locks adequately.

STEERING ALIGNMENT

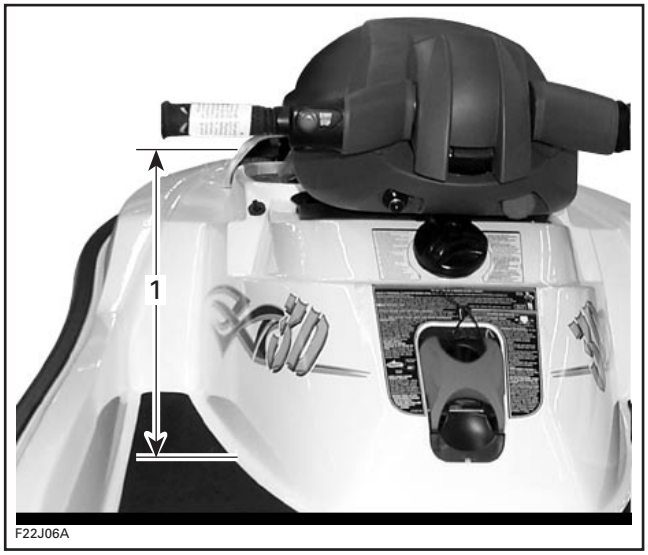
For steering alignment procedure, refer to ALIGNMENT.

ALIGNMENT

Alignment is to be performed when moto seat is deployed and installed.

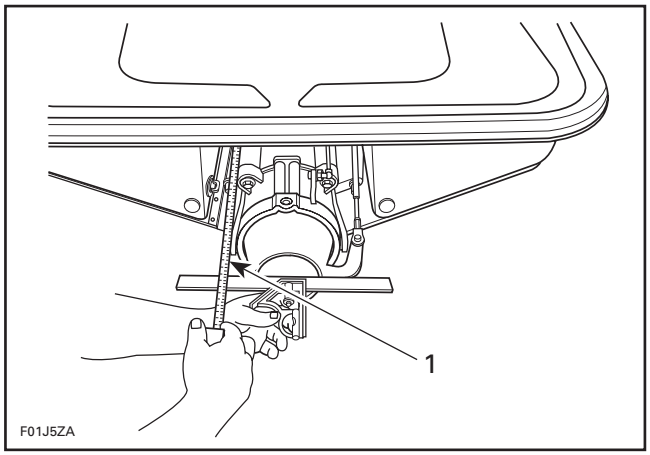


Position handlebar in straight ahead position by measuring each side the distance from handlebar grip end to floorboard.



1. Measuring handlebar grip end/floorboard distance

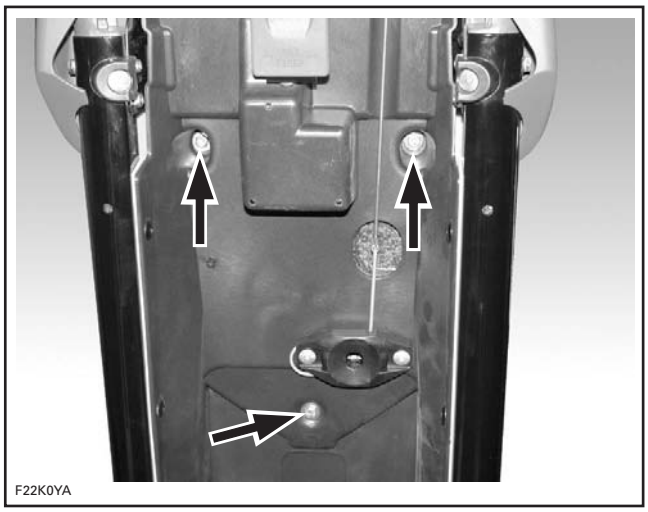
Check jet pump nozzle position by placing a straight edge on nozzle outer end. Measure the distance on each side of the straight edge. It must be equalled.



TYPICAL
1. Measure the distance on each side of the straight edge

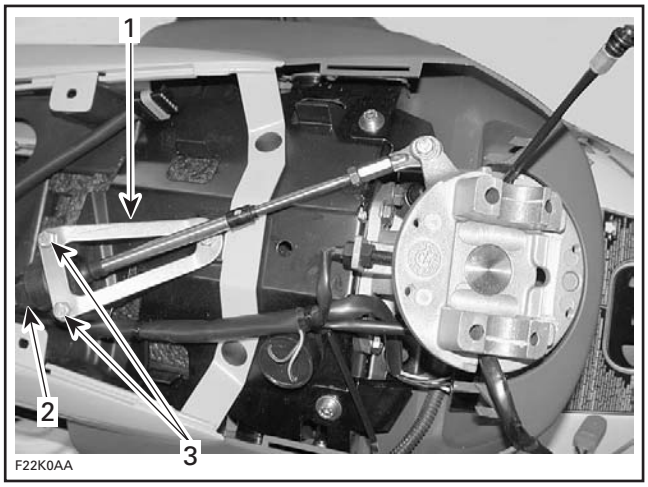
If necessary, steering alignment adjustment should be performed at steering cable support.

Remove top cover.



Loosen 2 bolts retaining block at cable support.

Turn adjustment nut as required.



1. Support
2. Adjustment nut
3. Loosen bolts

After adjustment, torque retaining block bolts to 5 N•m (44 lbf•**in**).

CAUTION: Verify when the handlebar is turned completely to the left or right side, that there is no interference with venturi or VTS ring.

Reinstall top cover.

ADJUSTMENT AND REPAIR

CLEANING

To clean the engine cover and the steering pole nose and top pieces, use only flannel cloths or an equivalent.

1. Engine cover, steering pole nose and top pieces

CAUTION: Use only recommended material to avoid damaging the surfaces.

To remove scratches on these parts, use BOMBARDIER* Scratch Remover Kit (P/N 861 774 800).

NOTE: Be aware that when using any scratch remover product, the part finish will turn to a dull appearance.

CAUTION: Never clean plastic parts or engine cover with strong detergent, degreasing agent, paint thinner, acetone, products containing chlorine, etc.

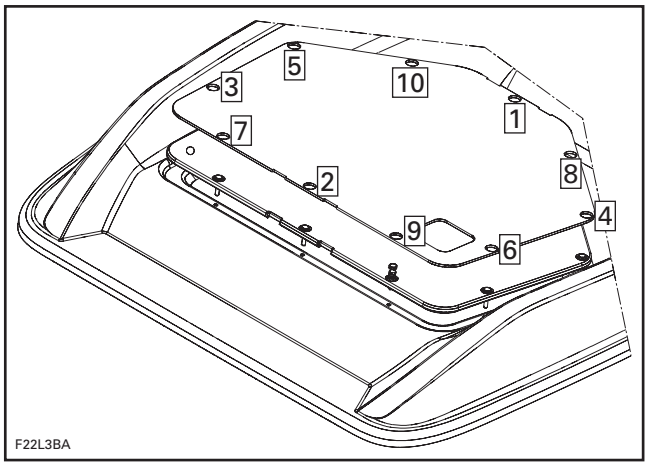
To clean the carpets, use 3M™ Citrus Base Cleaner (24 oz spay can) or the equivalent.

BILGE VENT TUBES

Ensure they are not obstructed and they are well fixed to body. Ensure they do not interfere with any hose.

REAR ACCESS COVER

When reinstalling cover, follow this tightening sequence.



KART SEAT

Check seat tab and anchor plate for wear or damage. Check latch mechanism for tightness, wear, cracks or other damage. Try pulling out the seat without releasing the latch.

1. Check seat tab and anchor plate
2. Check latch mechanism

3D RFI MODEL

ENGINE		3D RFI
Engine type		BOMBARDIER-ROTAX 787 RFI, 2-stroke
Induction type		Rotary valve
Exhaust system	Type	Water cooled (water jacket), water injection in muffler only
	Water injection fitting (head)	Not applicable
	Water injection fitting (cone)	Not applicable
	Water injection fitting (muffler)	3 x 3.5 mm (.138 in)
Exhaust valve		RAVE
Starting system		Electric start
Lubrication	Fuel/oil mixture	VROI (Variable Rate Oil Injection)
	Oil injection pump	Direct driven
	Oil injection type	XP-S™ synthetic 2-stroke
Number of cylinders		2
Bore	Standard	82 mm (3.228 in)
	First oversize	82.25 mm (3.238 in)
	Second oversize	Not applicable
Stroke		74 mm (2.91 in)
Displacement		781.6 cm^3 (47.7 in^3)
Corrected compression ratio		6.0:1
Cylinder head volume		47.7 ± 0.4 cc
Cylinder head warpage (maximum)		0.05 mm (.002 in)
Piston ring type and quantity		1 semi-trapez – 1 rectangular
Ring end gap	New	0.40 - 0.55 mm (.016 - .022 in)
	Wear limit	1.00 mm (.039 in)
Ring/piston groove clearance	New	0.025 - 0.070 mm (.001 - .003 in)
	Wear limit	0.24 mm (.009 in)
Piston/cylinder wall clearance	New (minimum)	0.13 mm (.005 in)
	Wear limit	0.22 mm (.0087 in)
Cylinder taper (maximum)		0.10 mm (.004 in)
Cylinder out of round (maximum)		0.08 mm (.003 in)
Connecting rod big end axial play	New	0.230 - 0.617 mm (.009 - .024 in)
	Wear limit	1.2 mm (.047 in)
Crankshaft deflection		MAG side: 0.050 mm (.002 in); PTO side: 0.030 mm (.001 in)
Rotary valve timing	Opening	147° ± 5° BTDC
	Closing	63.5° ± 5° ATDC
Rotary valve duration		159°
Rotary valve/cover clearance		0.25 - 0.35 mm (.010 - .014 in)
Connecting rod/crankshaft pin radial clearance	New	0.023 - 0.034 mm (.0009 - .0013 in)
	Wear limit	0.050 mm (.002 in)

ENGINE		3D RFI
Connecting rod/piston pin radial clearance	New	0.020 - 0.033 mm (.0008 - .0013 in))
	Wear limit	0.050 mm (.002 in)
Counterbalance shaft oil	Type	SAE 30 motor oil
	Capacity	30 mL (1 U.S. oz)
ADDITIONAL INFORMATION:		

ELECTRICAL			3D RFI
Magneto generator output	Wattage		270 W @ 6000 RPM
	Amperage		7 A @ 6000 RPM/13.5 volts
Ignition system type			Digital Inductive
Spark plug	Make and type		NGK BR8ES
	Gap		0.4 - 0.5 mm (.016 - .020 in)
Ignition timing (BTDC)	mm (in)		1.02 (.040)
	Degrees		12°± 1.0 (fixed timing mode at any RPM)
Battery charging coil			0.1 - 1 Ω
Ignition coil	Primary		0.3 Ω - 0.6 Ω
	Secondary		Not applicable
Engine rev limiter setting			7200 ± 50 RPM
Battery			12 V, 19 A•h (Yuasa/Exide)
Fuses	Main electrical system		20 A
	MPEM		5 A
	Information center		Not applicable
	Fuel pump		10 A
	Battery		15 A
	VTS system		10 A (installed but not in use)
O.T.A.S.	Steering switch type		Normally opened
	Steering switch resistance	Open	470 Ω ± 5%
	Steering switch resistance	Close	82.5 Ω ± 5%
	Solenoid resistance		14.9 Ω ± 5%
ADDITIONAL INFORMATION:			

FUEL SYSTEM	3D RFI
Fuel injection type	Rotax Fuel Injection, semi-direct, single throttle body (56 mm)
Fuel pressure	56 PSI - 60 PSI
Idle speed (in water)	1550 ± 100 RPM
Throttle Position Sensor (TPS)	1.6 kΩ - 2.4 kΩ (terminals 3-4) 710 Ω - 1380 Ω (terminals 4-11)
Crankshaft Position Sensor (CPS)	774 Ω - 946 Ω
Air Temperature Sensor (ATS)	2.28 kΩ- 2.74 kΩ
Water Temperature Sensor (WTS)	2.28 kΩ - 2.74 kΩ
Air Pressure Sensor (APS)	3.4 Ω - 8.2 Ω (terminals 2-9) 2.4 Ω - 8.2 Ω (terminals 1-2)

FUEL SYSTEM		3D RFI
RAVE solenoid		30 Ω
Fuel injector		2.4 - 0.1 Ω
Fuel	Type	**Regular** unleaded gasoline
	Minimum octane no.	Inside North America: 87 (R + M) / 2 Outside North America: 91 RON
ADDITIONAL INFORMATION:		

COOLING	3D RFI
Type	Open circuit — Direct flow from jet propulsion unit
Thermostat	None
Monitoring beeper setting	86 - 94°C (187 - 201°F)
ADDITIONAL INFORMATION:	

PROPULSION		3D RFI
Propulsion system		BOMBARDIER Formula pump
Jet pump type		Axial flow single stage
Impeller rotation (seen from rear)		Counterclockwise
Transmission		Direct drive
Coupling type		Rubber coupling, split FR & RR
Oil type		XP-S™ synthetic jet pump oil 75W90 GL5
Steering nozzle pivoting angle		20°
VTS nozzle pivoting angle		± 9°
Minimum required water level		90 cm (35 in)
Drive shaft deflection (maximum)		0.5 mm (.020 in)
Impeller outside diameter		155.0 mm (6.102 in)
Impeller/wear ring clearance	New	0.0 - 0.4 mm (.000 - .016 in)
	Wear limit	1.0 mm (.040 in)
Impeller shaft end play (new)		0
Impeller shaft side play		0.05 mm (.002 in)
Impeller pitch/material		Progressive pitch 11° - 20°/stainless steel
ADDITIONAL INFORMATION: Do not mix different brands or oil types.		

DIMENSIONS	3D RFI
Number of passenger (driver incl.)	1
Overall length	272 cm (107 in)
Overall width	112 cm (44 in)
Overall height	Vert: 92 cm (36.25 in) Moto: 112 cm (44.25 in) Kart: 96 cm (37.75 in)
Dry weight	Moto/Vert: 268 kg (589 lb) Kart: 274 kg (603 lb)
Load limit (passenger and luggage) 10 kg (22 lb)	114 kg (250 lb)
ADDITIONAL INFORMATION:	

CAPACITIES		3D RFI
Fuel tank (including reserve)		41 L (10.8 U.S. gal)
Fuel tank reserve (from low level signal)		6 L (1.6 U.S. gal)
Oil injection reservoir		4 L (1.05 U.S. gal)
Jet pump impeller shaft reservoir	Capacity	100 mL (3.4 U.S. oz)
	Oil level height	Up to plug
ADDITIONAL INFORMATION:		

MATERIALS	3D RFI
Hull	Composite
Inlet grate	Aluminum
Impeller housing/stator/venturi/nozzle	Plastic/plastic/aluminum/aluminum
Air intake silencer	Thermoplastic
Flame arrester	Multi-layer wire screen
Steering padding	Thermoplastic
Fuel tank	Polyethylene
Oil injection reservoir	Polyethylene
Seat	Polyurethane foam
ADDITIONAL INFORMATION:	

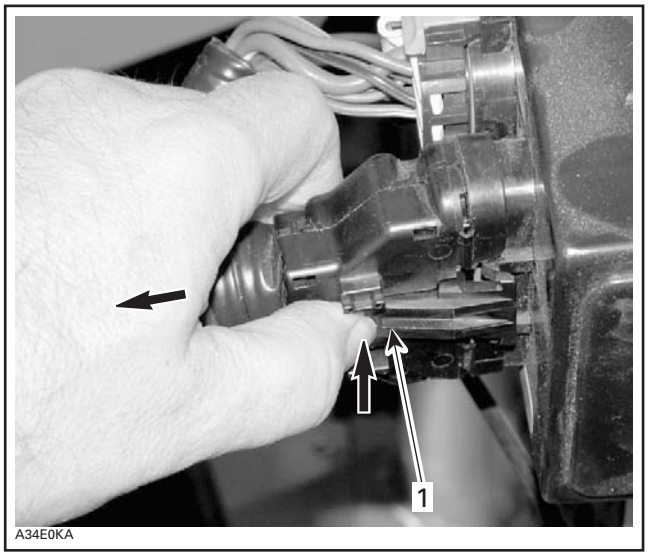
PERFORMANCE		3D RFI
Estimated pump power		42.6 kW (57 HP)
Maximum fuel consumption at wide open throttle		38 L/h (10 U.S. gal/h)
Cruising time at full throttle	Fuel tank without reserve	55 minutes
	Fuel tank reserve (from low level signal)	102 minutes
ADDITIONAL INFORMATION:		

WIRING DIAGRAMS

VCM CONNECTORS

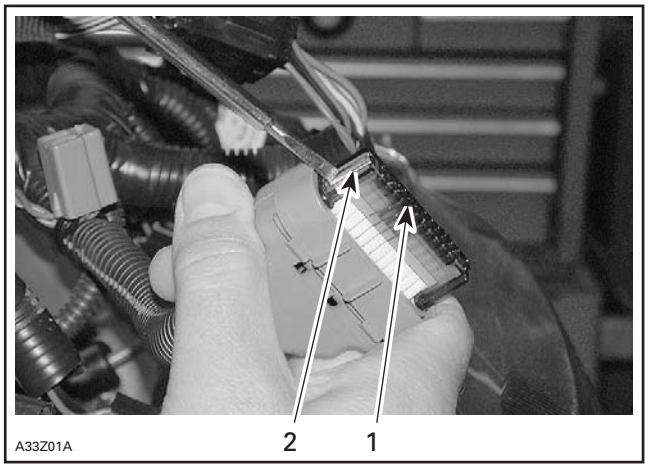
32-Pin Connector

Push down tab and hold to unlock connector while pulling it out.



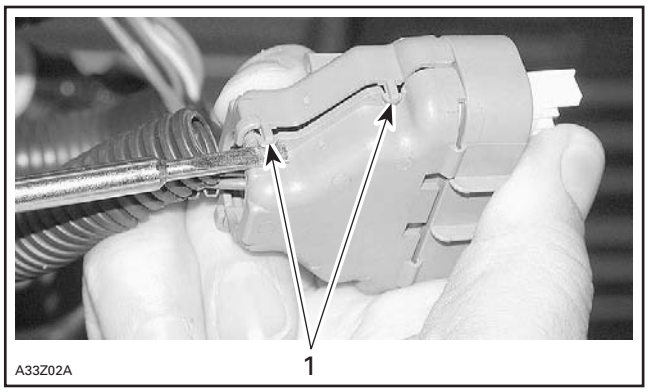
TYPICAL
1. Push tab and hold while pulling connector out

Push on both tabs to remove retainer.



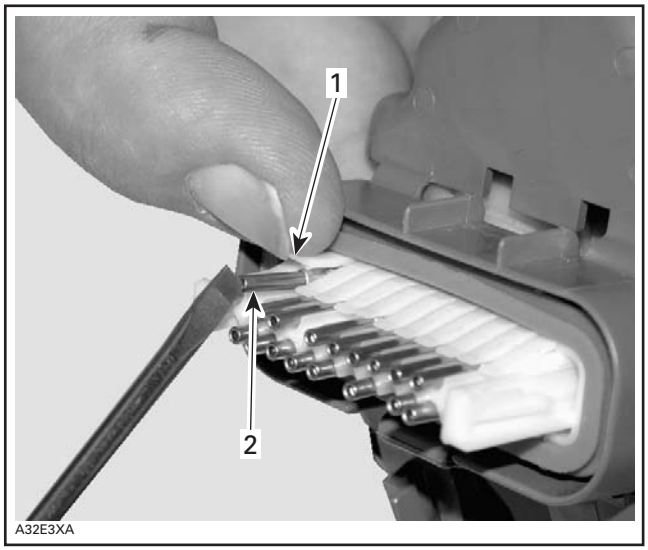
TYPICAL
1. Retainer
2. Tab (one on each side)

Open housing by lifting 4 tabs.



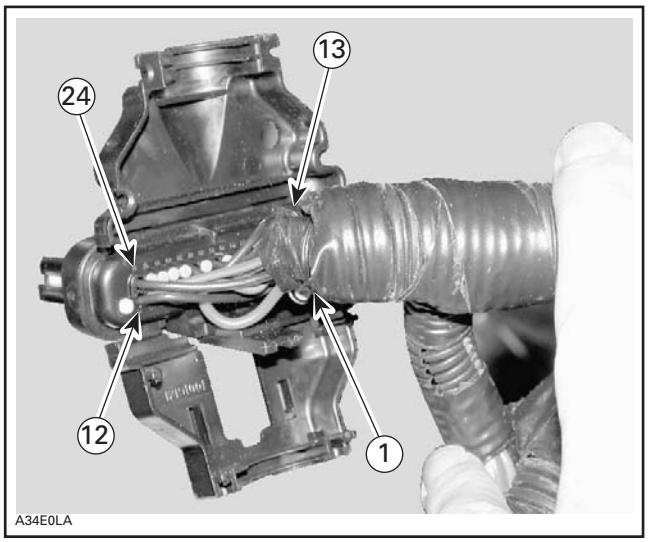
TYPICAL
1. Tabs (2 on each side)

Lift the top plastic lock of the female terminal to be removed and hold in position. Lift the female terminal to unlock from the housing and push out of housing.

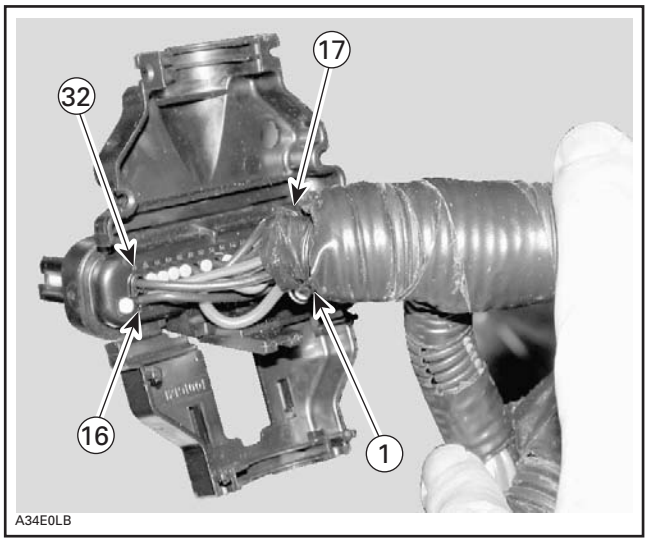


TYPICAL
1. Lift and hold plastic lock
2. Lift to unlock and push out

Refer to the illustrations for the connector pinout.



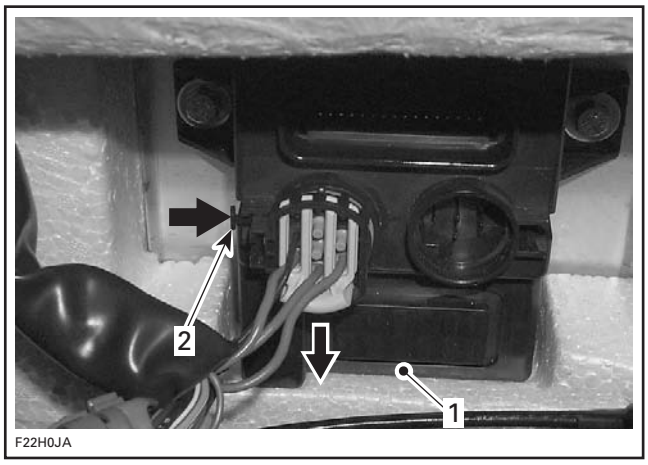
TYPICAL



TYPICAL

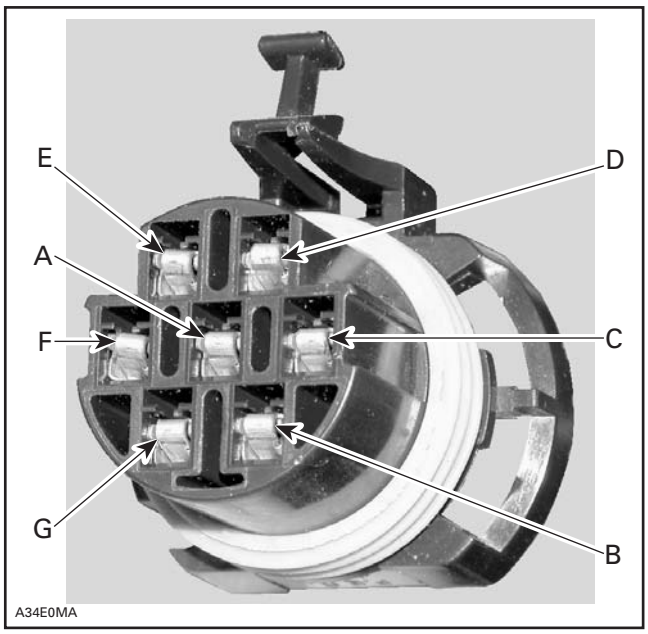
7-Pin Connector

Push down tab and hold to unlock connector while pulling it out.



1. VCM (vehicle control module)
2. Push down this tab and hold while pulling out connector

Refer to the illustration for the connector pinout.



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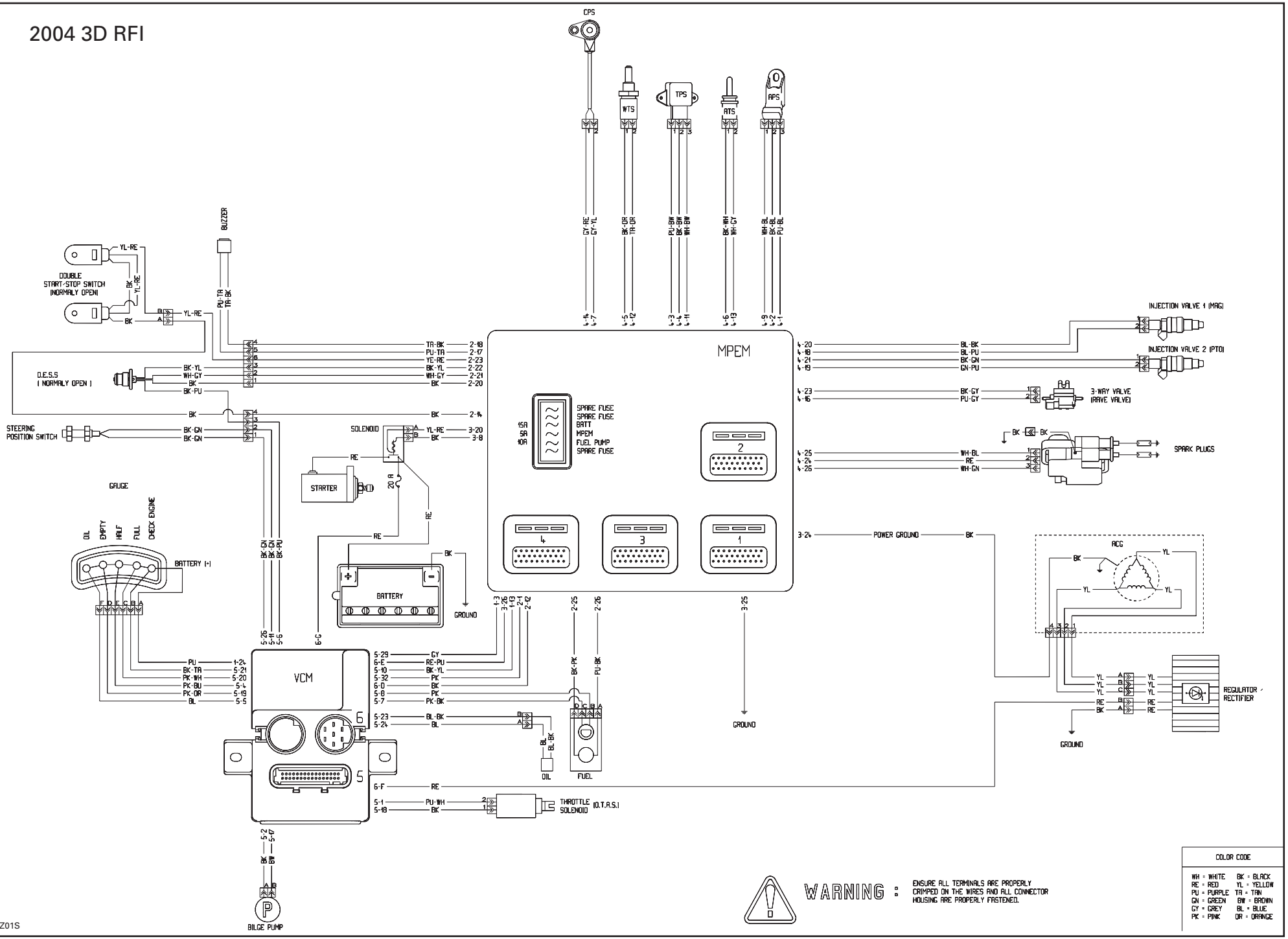
2004 3D RFI



WARNING : ENSURE ALL TERMINALS ARE PROPERLY CRIMPED ON THE WIRES AND ALL CONNECTOR HOUSING ARE PROPERLY FASTENED.

COLOR CODE	
WH = WHITE	BK = BLACK
RE = RED	YL = YELLOW
PU = PURPLE	TA = TAN
GN = GREEN	BW = BROWN
GY = GREY	BL = BLUE
PK = PINK	OR = ORANGE

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